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UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Service  
Crops Research Division  
Vegetables and Ornamentals Research Branch  
Potato Investigations  
Beltsville, Maryland

THE NATIONAL POTATO-BREEDING PROGRAM, 1962

By  
Robert V. Akeley and Others  
and  
State Cooperators

(Thirty-third Annual Report to Cooperators)  
Plant Industry Station  
Beltsville, Maryland

March 1963

This is a progress report of cooperative investigations containing data the interpretation of which may be modified with additional experimentation. Therefore, publication, display, or distribution of any data or any statements herein should not be made without prior written approval of the Crops Research Division, A.R.S., U. S. Dept. of Agr., and the cooperating agency or agencies concerned.

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PLANT INDUSTRY STATION (Beltsville, Md.) and  
CHAPMAN AND AROOSTOOK FARMS (Presque Isle, Maine)  
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-----

### Plant Industry Station

In 1962 in the greenhouses at Plant Industry Station, Beltsville, Md., 108 parents were planted and over 172 seed lines of various combinations were obtained. The following disease-resistant factors were involved: late and early blight; common and powdery scab; ring rot; leafroll and net necrosis; verticillium wilt; brown rot; corky ringspot; viruses X, A, Y, and S; and resistance to insects, nematodes, and tuber-greening. Other factors involved were: skin color (red, white, russet, and yellow), high solids, processing characters, yield, fertility, and maturity. Approximately 73,094 seedlings from 183 families were grown from true seed to tubers in the greenhouses and distributed to cooperators. A total of 31,165 potato seeds from 71 families were distributed also to cooperators.

### Distribution

The distribution of potato seed, new seedlings, advance selections, and named varieties continued. A summary of the shipments is given in P. I. table 1, 2, and 3. The true seed, new seedlings, and small lots of tubers were sent from the Plant Industry Station, but most of the larger shipments were made directly from Maine.

P. I. table 1. Distribution of potato seed and new seedlings from the greenhouse at Beltsville, Md., 1962.

Country or State	Cooperator	Number of Progenies	Number of	
			Tubers	Seeds
Australia	H. S. McKee	17		9,975
Ethiopia	L. A. Yager	9	1260	
Haiti	V. A. Wynne	1		800
Colorado	S. A. Alfieri, Jr.	35	5150	
Idaho	L. Sanford	17	2755	
Maine	A. E. Schark	170	40742	
New Jersey	C. E. Cunningham	34		18,140
North Dakota	R. H. Johnson	8		2,250
Ohio	J. P. Slesman	5	507	
Texas	B. A. Perry	30	9697	
West Virginia	K. C. Westover	12	2116	
Wisconsin	J. Weber	59	10867	

Many of the seedlings to be increased possess good horticultural characters along with high yielding ability combined with superior processing quality and multiple-disease resistance. Seedling B5063-3 is a fine example of a red seedling that yielded 354 cwt. per acre in Maine and has shown resistance to scab, silver scurf, verticillium wilt, leaf roll, greening, virus Y, and excellent chipping qualities at harvest and after conditioning out of storage.

#### Aroostook Farm, Presque Isle, Maine

In general, the 1962 growing season in Maine was cool and wet although the rainfall did not delay the planting or harvesting of the experimental plots.

All yield trials were planted on May 14. The Chapman 50-hill and the Aroostook 100-hill plots were planted on May 16 and 17. The remaining tests, including the single-hill material, were planted between May 14 and May 23. Twelve-hundred pounds of 10-15-15 fertilizer were applied to all plots at planting time. Alternate weekly sprays of dithane and dithane plus thiodan were applied to all plots from June 27 to August 14. The vines of all yield trials were killed with a rotobearer on September 10. These plots were harvested during the week of September 17 to 21. The vines of the Chapman and Aroostook 100-hill plots were killed by roto-beating on August 24. The Chapman plots were harvested on September 6 and the Aroostook plots on August 28 and 29.

About 244 named varieties and seedling selections were grown for increase on Aroostook Farm. Ona, Hunter, Penobscot, and Shoshoni were a few of the new varieties increased. In addition, 171 varieties and selections were grown for observation, distribution, and parents in the breeding plot, and 90 commercial varieties were grown in 10-hill rows in the variety collection.

#### Yield Tests and Quality Studies

Three varietal tests were grown on the Aroostook Farm--early maturing, midseason, and late. The selections in these tests were planted in 5 replications of 20 hills each. Data was obtained on yields, percentage of U. S. No. 1 tubers, specific gravity, and chip color. For unknown reasons the chip color has been unusually high this year as it was in 1961. Most of the selections cooked too dark for practical uses and will not be included in this report.

The data for the early maturity trials are given in P. I. table 6. Twenty-one seedling selections and 10 named varieties were tested in replications of 20 hills each, in comparison with 2 checks, Irish Cobbler and Cherokee.

The L.S.D. for yield at the 5% level was 68 cwt. With this as the criterion of significance, none of the named or numbered varieties yielded less than Irish Cobbler or Cherokee.

Those yielding higher than Cobbler were: B4182-1, B4590-6, B482804, Onaway, B4312-21, and B3725-1. The others were in the same class. Only one selection, B4312-21, yielded higher than Cherokee.

The L.S.D. for specific gravity at the 5% level was .004. The specific gravity of Irish Cobbler was 1.077, that of Cherokee 1.075. The specific gravity of the 30 varieties ranged from 1.057 to 1.077, with a mean of 1.068. None of the varieties was higher in specific gravity than either one of the two checks, but 24 were significantly lower than Irish Cobbler and 20 were significantly lower than Cherokee in specific gravity.

P. I. table 2. Distribution of named and numbered varieties to foreign countries, 1962.

Country	Cooperator	No. Varieties	Country	Cooperator	No. Varieties
Australia	L. R. Kavanagh	3	Italy	R. Rigotti	15
Canada	G. Bourassa	7	Korea	Mr. Choi	15
Canada	H. Genereaux	1	Mexico	J. Niederhauser	240
Canada	G. Johnston	250	Netherlands	C. Mastenbroek	2
Canada	S. K. Hisey, Jr.	3	Netherlands	H. T. Wiezsena	3
Canada	B. W. A. Parks	18	New Zealand	C. M. Driver	16
China	P. Chang	5	Norway	A. P. Lunden	6
Ethiopia	L. A. Yeager	13	Poland	K. Ruguski	1
Fiji Islands	H. Fisher	4	Puerto Rico	R. Woodbury	5
Haiti	E. T. Bullard	26	Russia	H. Hyland	18
Haiti	V. A. Wynne	7	Sweden	T. Denward	2
Iceland	E. Siggeirsson	5	Spain	Hera y. Saenz	38
Italy	L. Massa	15	Venezuela	A. Montaldo	7

P. I. table 3. Distribution of named and numbered varieties to States, 1962.

State	Cooperator	Number of Varieties	State	Cooperator	Number of Varieties
Alabama	W. J. Bro	1	Michigan	J. L. Heirman	1
Arizona	N. F. Oebker	6	Michigan	W. J. Hooker	4
Arkansas	R. A. McKnight	1	Michigan	N. R. Thompson	2
Alaska	A. Kallio	1	Minnesota	F. I. Lauer	48
California	G. N. Davis	37	Minnesota	O. C. Turnquist	2
Colorado	S. A. Alfieri	333	Minnesota	C. J. Eide	4
Colorado	D. Denna	14	Missouri	V. C. Lambeth	2
Connecticut	H. Hawkins	16	Montana	R. B. Dean	1
Connecticut	L. V. Edgington	4	Nebraska	W. Trank	1
Delaware	E. P. Brasher	11	Nebraska	D. R. Sherrill	1
Florida	E. N. McCubbin	41	Nebraska	R. O'Keefe	2
Florida	A. H. Eddins	20	New Jersey	C. E. Cunningham	461
Georgia	J. E. Bailey	18	New Jersey	T. S. Gill	8
Hawaii	J. C. Gilbert	10	New Jersey	J. C. Campbell	27
Idaho	L. Sanford	277	New Hampshire	S. M. Tasker	1
Idaho	W. M. Iritani	8	New Hampshire	W. A. Haley	1
Illinois	J. S. Vandemark	1	New York	L. C. Peterson	308
Indiana	C. Harris	2	New York	A. M. Schober	1
Iowa	C. G. Vandell	1	New York	E. E. Ewing	16
Iowa	J. Weigle	3	New York	R. L. Sawyer	32
Iowa	J. Horton	14	New York	J. S. Winfield	5
Kansas	J. K. Greig	2	New York	F. M. Ginberg	3
Kentucky	D. E. Knavel	15	North Carolina	F. Haynes, Jr.	14
Louisiana	J. C. Miller	2	North Dakota	E. P. Lana	252
Louisiana	T. P. Dykstra	4	North Dakota	B. Picha	2

continued



P. I. table 3, continued.

State	Cooperator	Number of Varieties	State	Cooperator	Number of Varieties
Maine	A. E. Schark	182	Pennsylvania	E. F. Hoover	30
Maine	H. N. Montgomery	1	Pennsylvania	R. W. Heyer	1
Maine	W. McBean	8	Pennsylvania	J. D. Harrington	22
Maine	I. Cyr	15	Pennsylvania	W. R. Mills	14
Maryland	G. B. Albin	2	Rhode Island	E. C. Drake	1
Maryland	J. A. Guy	2	Rhode Island	J. E. Sheehan	8
Massachusetts	A. Wolf	1	So. Carolina	W. R. Sitterly	61
Massachusetts	R. A. Mullany	6	So. Dakota	K. D. Fisher	49
Massachusetts	M. Weeks	9	Texas	J. M. Coruthers	19
Massachusetts	T. L. Borghoarn	1	Texas	H. Meyer	1
North Dakota	O. C. Schmitz	1	Texas	B. A. Perry	55
North Dakota	A. Beier	1	Utah	D. A. Huber	1
North Dakota	R. Edre	1	Vermont	F. W. Hale	1
North Dakota	M. L. Jendro	1	Virginia	M. M. Parker	6
North Dakota	R. Raisler	1	Washington	W. G. Hoyman	287
North Dakota	O. R. Streich	1	Washington	D. R. Bienz	3
North Dakota	A. E. Benson	41	West Virginia	M. Gallegly	14
Ohio	J. P. Slesman	80	Wisconsin	J. W. Jung	1
Ohio	G. Chadwick	1	Wisconsin	J. A. Schaenemann	1
Ohio	F. Lower	13	Wyoming	W. A. Riedle	6
Ohio	A. R. Hocking	1			
Ohio	R. A. Davis	2			
Oregon	G. E. Carter	16			

#### Chapman Farm

Four named varieties and 45 seedling selections were grown for increase on Chapman Farm in 100-hill rows. This material was used for evaluation tests of horticultural and quality characteristics, and for shipment to cooperators for yield trials and observation plots.

A summary of the maturity and fertility data on the new 10-hill rows grown on the Chapman Farm in 1962 is given in P. I. table 4. Field maturity was judged by comparing the 10-hill seedling selections with the standard varieties: Irish Cobbler (early), Kennebec (midseason), and Green Mountain (late). Fertility was measured by the relative number of seedballs produced per plant. Wide variations in the number of seedballs produced from year to year are caused by climatic conditions at the time of flowering and seedball formation. About 663 seedlings, or 48 percent, of the 1380 selections tested were midseason in maturity. This was the largest maturity class. The difference between the early and late maturity classes was less than 10 percent. About 1165, or 84.4 percent, of the 1380 selections observed failed to set seedballs. In 1961, 39 percent of the selections were unfruitful. Some fertility was noted in about 15 percent of the selections.





P. I. table 4. Maturity and fertility of seedlings grown in 10-hill rows on Chapman Farm, 1962.

Maturity classes	Seedlings		Fertility classes <sup>1/</sup>	Seedlings	
	No.	Pct.		No.	Pct.
Early	384	27.8	None	1165	84.4
Medium	663	48.0	Slight	104	7.5
Late	284	20.6	Medium	99	7.2
Very late	49	3.6	Good	12	0.9
Total	1380	100.0		1380	100.0

Approximately 40,742 seedling tubers, representing 167 family lines, were grown in the greenhouse at Beltsville, Maryland and replanted on the Chapman Farm in 1962. Of this total, 36,892, or 90 percent, were grown to maturity. Only 814 (2.2 percent) were selected for further testing.

The number of seedlings planted, the number grown to maturity, the number of selections made, and the number to be tested for their reactions to each of 11 different diseases in 1963, are given in P. I. table 5. The selections to be included in each of the disease resistance tests were determined by the phenotypes of the respective crosses.

P. I. table 5. Single-hill seedlings grown on Chapman Farm in 1962, showing the total number planted, grown, and selected, and the number of selections segregating for each of eleven diseases.

Planted	Grown	Selected	Late Blight	Scab	Ring rot	Viruses			Leaf roll	Vert. wilt	Gold nem.	Corky ring spot	Spdle Tuber
						A	X	Y					
40,742	36,892	814	748	520	199	638	165	245	266	268	94	182	65

Approximately 280 seedlings were maintained in 5-hill rows as part of the spindle tuber resistance study. In 1960, a test to obtain potato seedlings was initiated in cooperation with the Department of Plant Pathology of the University of Maine. From the original number, over 1700 seedlings in 1960, seedling B4577036 has shown a high level of field resistance when inoculated repeatedly over a 3-year period.

Two hundred and forty-two selections from the breeding program were tested for resistance to eight potato diseases, and maintained in 50-hill rows. The same 242 clones were sent to cooperators in Idaho, Washington, North Dakota, Colorado, and Canada for observation and reselection in these areas. Comparative yields, specific gravity, chip color, and resistance to greening were determined at the Maine location with all the 242 seedling selections, plus 116 retained from 1961. Using these data along with that obtained from the other 5 locations, 36 seedlings of 358, 50-hill seedlings grown in 1962 will be increased in 1963 as much as possible, 31 will be repeated again in 50-hill rows, 93 will be reduced to 20-hill rows, and 198 will be discarded.

P. I. table 6. Early-maturity yield trial, Aroostook Farm, Presque Isle, Maine, 1962.

Variety	U.S. No. 1 tubers per acre		Specific Gravity <sup>1/</sup>	Variety	U.S. No. 1 tubers per acre		Specific Gravity <sup>1/</sup>
	Cwt.	Pct.			Cwt.	Pct.	
Katahdin	360	92	1.074	Redburt	357	91	.072
I. Cobbler	304	86	.077	B605-10	350	92	.062
Cherokee	349	98	.075	B4312-21*	417	93	.057
B3331-7	312	88	.066	Earlaine	346	85	.067
B3139-24	327	86	.064	ND 3022-18	359	93	.069
B4128-1	405	93	.074	Haig	315	83	.067
B4590-6	399	89	.059	B3304-8	351	91	.059
B4744-2	326	88	.069	Kasota	361	84	.072
Rushmore	353	89	.075	B4093-18	340	93	.069
B4828-4	399	88	.058	B3837-11	299	82	.067
B4860-5	305	83	.069	Pawnee	359	87	.068
B3299-13	354	88	.073	B721-1	334	90	.066
B3841-15	296	91	.068	I1084-1	284	87	.067
B3149-36	288	86	.071	B3725-1	391	92	.067
Onaway	372	93	.071				
B3928-20	314	88	.068				
L.S.D. 5%	68		.004				
Mean	344		1.068				

<sup>1/</sup> Based on the average specific gravity of 10-tuber samples from 3 replications.

Thirty varieties and seedlings were included in the midseason trial. The data is presented in P. I. table 7.

Chippewa yielded 375 cwt. per acre. With an L.S.D. of 53 cwt. at the 5% level, six varieties, Redskin, Red Pontiac, B4523-8, LaRouge, Kennebec, and B3429-23 out-yielded Chippewa. Three varieties, B3872-6, Felton Seedling, and B3556-12 were significantly lower than Chippewa in yield, and the other 21 varieties were in the same class.

The percentages of U. S. No. 1 tubers for the 31 varieties ranged from 69 to 98 with a mean of 93. B3556-12 produced tubers with the lowest percentage of U. S. No. 1's, 69 percent.

The specific gravities of the 31 varieties ranged from 1.067 for B4094-9 to 1.086 for B3556-12 with a mean of 1.074. The specific gravity of the Chippewa tubers was 1.068. The L.S.D. at the 5% level was .005. Eighteen varieties were higher in specific gravity than Chippewa. None was significantly lower. The other 12 were in the same class.

B4523-8 does not green readily when exposed to light. In 1962, it produced 472 cwt. tubers per acre, 96% of which were No. 1's. Its specific gravity, 1.069, was in the same class as Chippewa.



### Virus Y Resistance

Of 311 advanced selections tested in 1961 for field resistance to aphid inoculation with virus Y, 190 developed Y-symptoms in the field. The remaining 121 selections that did not develop symptoms in the field were rechecked in the greenhouse at Beltsville. Fifty (50) of these selections were resistant while the other 71 selections developed symptoms in the greenhouse and were apparently susceptible.

A new set of 401 selections was field-tested for virus Y resistance. Approximately 162 of these selections did not develop symptoms of virus Y in the field and were brought to Beltsville for further testing. These results will be available in 1963.

### Virus A Resistance

Approximately 236 advanced seedling selections from the 1961 field test for resistance to virus A did not express symptoms in the field and were taken to Beltsville for further testing. Two plants of each selection were grafted with scions of virus A-infected USDA 41956. Those plants which did not display the hypersensitive top-necrosis reaction were indexed on Solanum demissum #175404 or the Cockerham selection of S. demissum. The top-necrosis reaction, indicating resistance of the hypersensitivity type, developed on 28 selections; no virus was recovered on the indicators from 102 selections, indicating that they were also resistant; and 106 selections were found to be susceptible.

In 1962, 401 new selections were tested for resistance to aphid inoculation with virus A in the field. Only a few selections developed symptoms in the field and the entire 401 were sent to Beltsville for greenhouse indexing. These results will be available in 1963.

### Virus X Resistance

Two plants of each selection in the 1961 field tests were mechanically inoculated with a virulent (necrotic) strain of virus X in the greenhouse. After a 6-week incubation period the plants were checked for symptoms and were indexed on Gomphrena globosa. Approximately 68 selections were resistant to inoculation by this method.

In the spring of 1962, 401 new selections were grown in the greenhouse on the Aroostook Farm in Presque Isle and tested for resistance to sap (or mechanical) inoculation with virus X. Approximately 163 selections appeared to be resistant in this test. The resistant selections will be tested further and the results will be available in 1963.

Presque Isle table 7. Midseason yield trial, Aroostook Farm, Presque Isle, Maine, 1962.

Variety	U.S. No. 1 tubers per acre		Specific <sup>1/</sup> Gravity	Variety	U.S. No. 1 tubers per acre		Specific <sup>1/</sup> Gravity
	Cwt.	Pct.			Cwt.	Pct.	
Redskin	513	98	1.075	B3391-2	375	94	1.070
Red Pontiac	492	97	1.071	Chippewa	375	92	1.068
B4523-8	472	96	1.069	Ona	374	93	1.078
LaRouge	454	95	1.069	B3604-1	372	94	1.074
Kennebec	437	95	1.080	Keweenaw	365	95	1.072
B3429-23	430	92	1.075	B4846-9	362	90	1.075
B4316-10	416	93	1.072	Norgleam	360	96	1.069
LaChipper	415	96	1.076	Blanca	350	90	1.078
B3819-17	414	96	1.079	F4613	341	96	1.074
B3353-9	412	95	1.069	Redbake	334	91	1.077
B4321-23	411	94	1.076	B4094-9	325	93	1.067
F5025	407	95	1.077	B3872-6	321	94	1.076
B4093-2	395	96	1.072	Felton Sdlg.	317	88	1.074
Katahdin	391	94	1.076	B3356-12	199	69	1.086
B3454-5	378	94	1.069				
51.1-53-12	376	94	1.069				
L.S.D. 5%	53		.005				
Mean	385	93	1.074				

<sup>1/</sup> See footnote P. I. table 6.

The yield percentage U. S. No. 1 tubers and specific gravity for 31 late maturing varieties are found in P. I. table 8.

The L.S.D. for yields at the 5% level was 50 cwt. Taking Katahdin, the most widely grown variety in Maine, as the check and 50 cwt. the criterion of significance, it is seen that 2 seedling varieties, B4557-2, and B3677-1, outyielded Katahdin significantly. Allehanna, Green Mountain, Saco, Emmet, and the numbered seedlings, B3352-8, B2368-13, B3114-67, B4312-6, B3478-58, B3401-25, B3453-2, B4093-2, B4605-13, B4134-26, B4119-1, B4473-3, and La3769, were in the same class as Katahdin. Delus, Arenac, and the other 9 numbered varieties were lower in yield than Katahdin.

In specific gravity none of the varieties in the test exceeded Green Mountain (1.086) significantly. Arenac, Delus, and B3478-58 were in the same class as Green Mountain. Two varieties, Saco, and B3452-2, had specific gravity of 1.080. The specific gravity of the 31 varieties ranged from 1.061 to 1.088 with a mean of 1.073.

P. I. table 8. Late-maturity yield trial, Aroostook Farm, Presque Isle, Maine, 1962.

Variety	U. S. No. 1 tubers per acre		Specific Gravity <sup>1/</sup>	Variety	U. S. No. 1 tubers per acre		Specific Gravity <sup>1/</sup>
	Cwt.	Pct.			Cwt.	Pct.	
B4557-2	517	90	1.076	B4134-26			1.071
B3677-1	497	98	1.072	B4119-1	387	96	1.065
B3352-8	467	95	1.077	B4473-3	386	90	1.076
Allehanna	450	97	1.070	La3769	382	96	1.063
B2368-13	441	96	1.074	Emmet	378	95	1.078
Gr. Mountain	435	94	1.086	ND4192-3	367	89	1.076
Saco	433	95	1.080	Delus	362	97	1.084
B3114-67	422	98	1.064	B4580-1	337	91	1.073
Katahdin	420	96	1.075	B2971-14	334	93	1.079
B4312-6	407	95	1.063	Arenac	309	80	1.085
B3478-58	406	91	1.088	B3428-30	304	93	1.066
B3401-25	403	96	1.066	B4170-7	304	91	1.064
B3453-2	398	92	1.080	La6279	310	92	1.061
B4093-2	395	96	1.076	B4084-8	277	92	1.067
B4605-13	394	96	1.064	B4094-9	273	92	1.065
				B4094-18	253	93	1.068
L. S. D. 5%	50		.004				

<sup>1/</sup> See footnote 1 table 6.

#### Seedpiece Spacing Trial (Aroostook Farm)

Five varieties, Redskin, B3692-4, B2894-24, B3563-2, (Penobscot), and Ona, were grown at 8, 10, 12, and 14 inch seedpiece spacings. The data for this test are tabulated in P. I. table 9. The yield of U. S. No. 1 tubers, the number of U. S. No. 1 tubers, and the average weight of U. S. No. 1 tubers was determined for each seed spacing. Specific gravity of all material was also determined. The specific gravity data has not been listed, as no definite trend in the results could be observed. Three of the varieties, B3692-4, B2894-24, and B3563-2 (Penobscot) produced the highest yield at an 8-inch spacing. Redskin and Ona reached a maximum yield at a 10-inch spacing. Only one variety, Redskin, produced a maximum yield (443 cwt.) and an optimum tuber size (8.3 oz.) at the same seed spacing (10 inches).

The average tuber size of B3692-4, B3563-2, and Ona did not reach an optimum size of 8.0 oz. at any spacing. B2894-24 had an average 8.0 oz. tuber at 14-inch spacing but reached maximum yield at the 8-inch spacing. The mean yield of U. S. No. 1 tubers and the mean number of U. S. No. 1 tubers decreased from 364 cwt. to 330 cwt. and from 188 to 142, respectively, as the seed spacing was increased from 8 to 14 inches. Redskin was the highest yielding, and Ona the lowest yielding entry in the test. From the one-year data presented in this test, the optimum spacing at which all varieties, except B3563-2, should be grown is 10 inches. B3563-2 could be grown at either a 12- or 14-inch spacing. These spacings are a compromise between maximum yield per acre and optimum tuber size for tablestock.



P. I. table 9. Yield,<sup>1/</sup> average tuber weight,<sup>2/</sup> and number of U. S. No. 1 tubers of 5 varieties at 4 different seedpiece spacings, Aroostook Farm, Presque Isle, Maine, 1962.

	Redskin	B3692-4	B2894-24	B3563-2	Ona	Means
8-inch spacing						
U.S.No.1 tubers,Yield-Cwt.	421	377	386	346	290	364
U.S.No.1 tubers, No.	176	200	178	193	195	188
Av. tuber wt. Oz.	7.1	5.7	6.5	5.6	5.5	6.1
10-inch spacing						
U.S.No.1 tubers,Yield-Cwt.	443	364	336	316	319	356
U.S.No.1 tubers, No.	162	194	146	147	176	165
Av. tuber wt. Oz.	8.3	6.0	7.4	6.3	5.7	6.7
12-inch spacing						
U.S.No.1 tubers,Yield-Cwt.	427	345	327	340	295	347
U.S.No.1 tubers, No.	147	165	135	148	156	150
Av. tuber wt. Oz.	8.6	6.5	7.5	7.5	6.5	7.3
14-inch spacing						
U.S.No.1 tubers,Yield-Cwt.	397	343	344	266	301	330
U.S.No.1 tubers, No.	137	167	136	127	144	142
Av. tuber wt. Oz.	10.0	6.4	8.0	6.5	6.5	7.5
Means						
U.S.No.1 tubers,Yield Cwt.	422	357	348	317	301	
U.S.No.1 tubers No.	155	181	149	154	168	
Av. tuber wt. Oz.	8.5	6.1	7.3	6.5	6.0	

<sup>1/</sup> L.S.D. .01 level between 2 varieties 43 cwt.

<sup>2/</sup> L.S.D. .01 level between 2 varieties .6 oz.

L.S.D. .01 level between 2 spacings .5 oz.

#### Scab Resistance

Three hundred and fifty-three seedling selections were tested for scab resistance in comparison with the scab susceptible variety Green Mountain. Data for this test are summarized in P. I. table 10. Thirteen of the selections were scab-free. The most frequent surface area observed was 1 (1 to 20 percent of the surface), and the most frequent pustule type, number 2 (large, but still superficial). All of the tubers of the Green Mountain check variety had 41 to 60 percent of their area covered with number 4 pustules.

P.I. table 10. Summary of the data observed from the scab test on Aroostook Farm, Presque Isle, Maine, 1962.

	Total hills	Scab free	<sup>1/</sup> Surface area covered					<sup>2/</sup> Pustule type			
			T	1	2	3	4	1	2	3	4
Seedling selections	353	13	64	124	74	57	21	70	105	88	77
Green Mountain checks	353	0	0	0	0	353	0	0	0	0	353

<sup>1/</sup> Surface area covered: T, less than 1%; 1, 1 to 20%; 2, 21 to 40%; 3, 41 to 60%; 4, 61 to 80%.

<sup>2/</sup> Type of pustule: 1, small superficial; 2, large, but still superficial; 3, large, rough pustules; 4, large, rough pustules deeply pitted.

Scab Nursery Test  
R. V. Akeley and Cooperators<sup>1/</sup>

In 1962, 35 selections, 14 from Minnesota and 21 from U.S.D.A. (Maine), were grown in 2-hill plots (2 replications) at 8 locations. The results based on pustule type are shown in Scab table 1 for 4 of the locations. Considerable variation occurred in pustule type within and between areas for various seedlings.

Scab table 1. Scab nursery test, 1962.

Variety or Seedling	Seed <sup>1/</sup> source	Maine <sup>2/</sup>		South Dakota		Colorado		Idaho	
		Rep.1	Rep.2	Rep.1	Rep.2	Rep.1	Rep.2	Rep.1	Rep.2
16.54-10	Minn.	-	-	2	-	0	-	3	-
18.55-1	"	0 <sup>3/</sup>	1	2	2	2	1	4	4
18.55-23	"	0	0	1	1	1	1	5	1
20.55-5	"	2	1	1	1	0	1	5	4
32.54-7	"	2	1	-	-	3	3	3	3
52.54-10	"	0	2	1	1	0	0	5	5
54-54-7	"	3	0	1	1	0	2	5	5
69.49-4	"	1	0	1	2	0	1	3	3
79.53-3	"	1	-	2	-	0	-	5	-
79.53-11	"	1	2	2	2	1	1	4	5
81.53-10	"	2	2	3	-	1	1	5	1
91.53-11	"	0	3	2	2	1	1	3	3
109.49-2	"	3	0	1	1	1	0	5	4
162.52-3	"	3	4	1	1	1	1	5	5
B 3352-8	USDA	3	2	1	0	2	1	5	5
B 3401-25	"	1	3	0	1	2	1	4	4
B 3427-7	"	1	2	2	2	1	1	5	5
B 3692-4	"	1	1	1	1	1	1	4	5
B 3819-17	"	3	0	1	1	1	1	5	5
B 4094-21	"	0	0	Russet		2	1	3	5
B 926-9	"	1	1	1	0	1	1	5	5
B 3457-2	"	2	1	1	3	0	0	0	0
B 3726-6	"	0	1	1	1	1	0	1	5
B 4312-21	"	1	0	2	1	1	0	5	4
B 4088-4	"	1	0	1	1	1	2	5	5
B 4094-9	"	1	0	Russet		1	2	5	0
B 4094-18	"	0	0	1	-	1	1	5	5
B 4580-1	"	1	3	2	2	2	2	5	5
B 4804-1	"	4	1	1	1	2	1	5	5
B 4804-11	"	3	1	1	1	1	1	5	5
B 4805-1	"	4	4	3	1	1	1	5	4
B 4807-1	"	0	3	2	2	1	1	5	2
B 4871-3	"	0	0	2	2	1	2	5	1
Early Gem	"	0	0	Russet		0	-	4	2
Katahdin	"	4	4	1	1	2	1	5	5

<sup>1/</sup> Seed source: Minnesota and Maine

<sup>2/</sup> Two replications (2-hill plots) at each location

<sup>3/</sup> Pustule types: 1=small, superficial; 2=large, superficial; 3=large, rough pustules; 4=large pustules, shallow pits; 5=large pustules, deep pits.

<sup>1/</sup> Colorado, S. A. Alfieri; Idaho, L. Sanford; Maine, A. E. Schark; South Dakota, K. D. Fisher.

### Verticillium Wilt Resistance

For the past three years the material tested for verticillium wilt resistance has been dipped in a slurry of the wilt organism before planting. A number of different isolates of Verticillium albo-atrum grown on potato dextrose liquid culture were mixed to produce the slurry. The tubers of the selections were freshly cut in the field, dipped in the fungus suspension, and planted immediately, in damp soil. The planting furrows were opened just prior to planting and closed within a short time after planting.

Over 200 selections from 83 family lines were tested for wilt resistance in 1962. P. I. table 11 lists the data from this test. The check varieties were planted at intervals of 25 rows throughout the plot. Houma is resistant to wilt; Katahdin moderately resistant; and Kennebec and Cherokee are susceptible to wilt.

A high degree of resistance to verticillium wilt exists in the parental material used in the breeding program. Despite the severe treatment of applying the organism directly to a cut tuber surface, eight percent of the selections were wilt-free.

P. I. table 11. Reaction to Verticillium wilt of inoculated seedling selections and 4 check varieties grown in wilt-infested soil on Aroostook Farm, Presque Isle, Maine, 1962.

	5-hill units			Individual hills		
	tested	.infected.		Total	. Infected	
	No.	No.	Pct.	No.	No.	Pct.
204 selections from 83 family lines	204	187	92	998	596	60
Checks						
Houma	9	7	78	45	15	33
Katahdin	8	7	87	40	25	62
Kennebec	9	9	100	45	32	71
Cherokee	9	9	100	45	45	100

### Varietal Reaction to Net Necrosis and Stem-end Browning

Changes made in the techniques used in the net necrosis and stem-end browning tests in the past three years have been successful in increasing the incidence of these two diseases in the material tested. It has been established from these changes that the material under test must be inoculated with viruliferous aphids late in the growing season. It is also important to prevent early leafroll infection. In 1962, 34 named and numbered varieties were planted in 10-hill rows isolated from the leafroll plots. The plots received weekly sprayings of the insecticide thiodan up to one month before inoculation. A minimum of five viruliferous aphids were placed in the crown of each plant on August 2, and sprayed on August 6 with thiodan to prevent the migration of the aphids. The data for this test are given in P. I. table 12. The check varieties Mohawk, Green Mountain, Kennebec, and Katahdin were planted at intervals of 10 rows throughout the test. Mohawk was highly susceptible in this test with 89.0% of its tubers showing net necrosis, Green Mountain showed its susceptibility with 71.2%, Kennebec showed a high degree of resistance with 1.6%, and Katahdin as usual had no net necrosis.



Twenty-one varieties showed no net necrosis and 28 showed no stem-end browning and 16 including the Katahdin check showed no symptoms of either disease. Norgleam, with 67.2% net necrosis and 13.0% stem-end browning was the only variety that showed symptoms of both diseases.

P. I. table 12. Net necrosis and stem-end browning in 30 selections and four check varieties tested on Aroostook Farm, Presque Isle, Maine, 1962.

Selection				Selection			
or	Tubers	Net	Stem-end	or	Tubers	Net	Stem-end
Variety	Examined	Necrosis	Browning	Variety	Examined	Necrosis	Browning
	No.	Pct.	Pct.		No.	Pct.	Pct.
Mohawk	247	71.2	0	Mesaba	44	0	0
Green Mount'n	165	89.0	0	Nordak	37	11.2	0
Kennebec	190	1.6	0	Norgleam	46	67.2	13.0
Katahdin	123	0	0	Norland	43	0	0
Allehanna	46	0	0	Ona	77	10.4	0
Antigo	46	0	0	Onaway	35	0	0
Arenac	61	3.3	0	Osage	41	0	0
Avon	48	10.4	0	Pawnee	55	21.8	0
Blanca	72	0	0	Potomac	47	0	0
Catoosa	34	0	0	Redskin	46	0	0
Earlaine	31	0	19.3	Snowflake	57	19.3	0
Emmet	63	0	0	Superior	40	42.5	0
Fundy	50	46.0	0	Wy 1122	51	0	3.9
Golden Chip	59	0	0	B2894-24	63	0	4.7
Keweenaw	41	0	0	B3563-2	53	00	0
LaChipper	67	7.5	7.5	B3570-5	56	0	3.6
LaRouge	55	0	18.2	B3692-4	51	0	0

#### Golden Nematode Resistance

Results of the 1962 golden nematode test are summarized in P. I. table 13. Eleven family lines were tested for resistance. Resistance to the organism was found in all lines, however, over 51 percent of the plants of both pedigree numbers B5240 and B5288 were resistant to the golden nematode. The procedure for evaluating the resistance to golden nematode was the same as that used in previous years. Testing for golden nematode resistance is a cooperative program with the Cornell Agricultural Experiment Station.

P. I. table 13. Golden nematode tests. Selections made in Maine, 1961, and tested on Long Island, New York, 1962. 1/

Pedigree Number	Parentage	Maine, 1961 selected	Tested New York, 1962	
			Susceptible	Resistant
		No.	No.	No.
B5263	B3944-11 x B3139-24	27	16	11
B5237	B4146-4 x Cherokee	15	8	7
B5240	B3696-13 x B4075-1	29	14	15
B5246	B4523-8 x Merrimack	7	4	3
B5281	B4158-5 x B4312-4	43	27	16
B5287	B4523-8 x B4116-2	45	28	17
B5288	NJI-6 x B3692-4	58	28	30
B5289	NUX-3 x Norland	20	11	9
B5290	NUX-3 x B3627-18	15	8	7
B5291	NUX-3 x B4116-2	35	18	17
B5313	NUT-15 x Merrimack	3	2	1
Totals		297	164	133

1/ Tests were made by L. C. Peterson and co-workers on Long Island, New York.

#### Late Blight Injury as Reflected in Yield and Specific Gravity

Three highly late blight resistant varieties, Saco, Kennebec, and Merrimack, and two moderately resistant varieties, Menominee and Sebago, were compared in yielding ability and specific gravity with the susceptible variety Katahdin. Four spray treatments, water, DDT, dithane, and DDT plus dithane were applied at weekly intervals from June 27 to August 14. The results of this test are given in P. I. table 14. The yield of all varieties except the two resistant varieties Saco and Merrimack were increased by applying dithane and DDT. As expected, the greatest yield increase occurred in the susceptible variety Katahdin. Except for the varieties Merrimack and Katahdin the lowest yields occurred under the DDT only treatment. Why the yield of this treatment is less than the water treatment is unknown. The tendency for the DDT treatment to be the lowest in yield has been noted for several years. Usually the difference is nonsignificant, as it is this year. The greatest difference in mean specific gravity was between the varieties Merrimack and Katahdin. Merrimack had the highest mean specific gravity (1.087), and Katahdin the lowest (1.065).



P. I. table 14. Reaction of 6 varieties to late blight as reflected in yields and specific gravity of 4 spray treatments, Aroostook Farm, Presque Isle, Maine, 1962.

Treatments, Yield, $\frac{1}{2}$ and Specific Gravity $\frac{2}{2}$											
Water			DDT			Dithane			DDT + Dithane		
U.S.No.1	Specific	Yield	U.S.No.1	Specific	Yield	U.S.No.1	Specific	Yield	U.S.No.1	Specific	Yield
Yield	gravity	Cwt.	Yield	gravity	Cwt.	Yield	gravity	Cwt.	Yield	gravity	Cwt.
Saco	1.085	458	424	1.084	422	1.087	1.085	443	1.085	1.085	437
Kennebec	1.084	371	360	1.083	376	1.082	1.079	391	1.079	1.082	374
Merrimack	1.085	308	313	1.089	292	1.086	1.088	302	1.088	1.087	304
Menominee	1.069	192	178	1.066	318	1.078	1.081	298	1.081	1.073	246
Sebago	1.066	142	117	1.066	259	1.076	1.072	293	1.072	1.070	203
Katahdin	1.062	54	68	1.060	229	1.068	1.069	227	1.069	1.065	144
Means	1.075	254	243	1.075	316	1.079	1.079	326	1.079		

1/ L. S. D. .01 level between any 2 varieties 39 cwt.  
 " " " " 2 varieties 28 cwt.  
 " " " " 2 varieties for the same treatment 68 cwt.

2/ L. S. D. .01 level between any 2 varieties .003.  
 " " " " 2 varieties .003.  
 " " " " 2 varieties for the same treatment .007.

# Potato Greening

Varying intensities of greening of potato tubers have been observed and measured by subjective and objective methods after exposure to a combination of daylight and fluorescent light. Tuber samples from the Chapman 50-hill row increase plots, from all the yield tests grown in Maine, were sent to Beltsville, irradiated at 10-hour intervals for 10 days. After 100 hours exposure, light transmittance tests were made to determine the intensity of greening.

Results obtained using a light-transmission instrument showed good separation in the material for greening intensity. The single-tuber seedling distribution of the 9 progenies shown in P. I. table 15 is typical when only one parent has tuber resistance to nongreening.

Of the 346 selections from the 50-hill increase plots exposed to 100 hours, the greening distribution was as follows: 5, none; 67, trace; 160, slight; 94, moderate; 20, intense. Most of the selections and varieties in the 5 yield tests and the variety collection varied from slight to intense in greening.

P. I. table 15. Segregation of tuber-greening intensity in seedling potatoes grown in Maine and exposed to combined daylight and fluorescent light at Beltsville, Maryland, 1962.<sup>1/</sup>

Pedigree Number	Parents	Seedling tuber greening classes <sup>2/</sup>					Total Seedling Tubers
		1	2	3	4	5	
B5443	B3627-18 x B4523-8	1	14	33	23	14	85
B5463	B4523-8 x B4116-2	8	35	45	12		100
B5483	B922-3 x Merrimack	5	29	44	18	4	100
B5484	B922-6 x Merrimack		11	16	15	5	47
B5485	B922-6 x B3692-4	1	13	38	39	8	99
B5487	B3692-4 x B922-6	1	9	17	14	5	46
B5488	B4523-8 x Merrimack	15	45	34	5		99
B5489	B4523-8 x (X96-56)	8	54	32	6		100
B5510	B922-6 x B24-58	2	10	16	10	5	43

<sup>1/</sup> Exposed 100 hours at 35 foot-candles of incident light.

<sup>2/</sup> Greening classes: 1, none, 2, trace; 3, slight; 4, moderate; 5, intense.

## Solanum Species and Hybrids

R. W. Buck, Jr.

Thirty-four diploid species were grown at Beltsville in 1962 for cytological and crossability investigations. Chromosome pairing was normal with usually 12 bivalents at metaphase I. Seed was obtained from 62 combinations among the diploid species.

Progenies of 106 diploid hybrid combinations were grown for cytological investigations. The majority of the plants showed normal chromosome behavior. F<sub>2</sub> seed was obtained from sib-matings in 42 of the F<sub>1</sub> progenies.

Potato Disease Investigations

W. B. Raymer, Muriel J. O'Brien, E. S. Schultz,  
A. L. Schark, R. V. Akeley, and R. W. Buck, Jr.

Late Blight Resistance

Advanced selections from the breeding program were tested for resistance to the various races of late blight in the greenhouse at Beltsville by the detached leaf technique. The results are given in P. I. table 16.

P. I. table 16. The number and genotypes of selections resistant to various races of late blight out of a total of 243 selections tested.

Late Blight Race	0	2,3,4	1,3,4	1,2,4	1,2,3
No. of Resistant Selections	118	86	3	47	69
Genotypes	-	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>

Forty-five selections were found to have 2 major genes in combination and twenty-one selections had 3 major genes in combination. Of the latter, most combinations involved genes R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>.

At Aroostook Farm, Presque Isle, Maine, 283 advanced selections were tested for field resistance to race 0 of late blight. An additional set of 116 selections that had been previously screened in Mexico for field (or minor gene) resistance to late blight was also tested. Repeated inoculations were made with zoospore suspensions of Phytophthora infestans beginning the end of June and continuing until all the susceptible clones were infected.

The Green Mountain and Kennebec varieties were used as checks. Indicator plants for the various races of late blight were also included in the plot.

Blight developed well in the plot by the 23rd of July when at least one-half of the leaves of all the Green Mountain plants had late blight lesions. Kennebec remained free of blight until about August 20, when other races of blight made their appearance on that variety as well as on the other indicator plants. From reactions of the various indicators it appeared that about 7 races in addition to the "0" race were present in the last few weeks of the growing season. Many selections which had been free of blight through most of the summer apparently succumbed to these new races in the midpart of August. A number of the advanced selections did remain free of blight until the end of the season and a majority of the field-resistant selections also remained free. These results are summarized in P. I. table 17.

P. I. table 17. Resistance of selections to the "0" race of late blight, Aroostook Farm, 1962.

	Number Tested	Susceptible to Race "0"	Resistant only until 8/20/62	Resistant until end of season
Advanced Selections	283	153	113	27
Field Resistant Selections	116	13	30	73



INTER-REGIONAL POTATO INTRODUCTION PROJECT

(Cooperative State-Federal Project)

R. W. Ross and R. W. Hougas  
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Six-hundred and forty-five new stocks were received in 1962. These were introduced from 12 countries (Argentina, Bolivia, Canada, Chile, Colombia, Ecuador, England, West Germany, Guatemala, Mexico, Netherlands, Peru). Nearly two-thirds of these introductions were of the species S. andigena from the collection of Dr. H. J. Toxopeus, Wageningen, the Netherlands. This species continues to be an unusually promising source of germ-plasm for improvement of the commercial potato.

A Solanum expedition to Mexico and South America is currently underway, sponsored by NSF and led by Mr. Don Ugent, Department of Botany, University of Wisconsin. The IR-1 project will receive seeds or tubers of all Solanums collected by this expedition.

The number of species introductions requiring a short photoperiod for tuberization has steadily increased as a result of several recent Solanum expeditions. To provide the necessary space under glass the existing stocks of intermediate photoperiod requirement, i.e. interspecific hybrids backcrossed one or more generations to S. tuberosum, were propagated in an aluminum frame, plastic-covered greenhouse following earlier successful trials. Supplying heat when necessary into the relatively short days of November provided a satisfactory tuber increase of this type of material.

Very satisfactory increases of both tubers and seed were obtained in 1962 from greenhouse and screenhouse propagated plants.

Shipments of seeds and tubers were made during the past year to 22 states (Alaska, California, Colorado, Idaho, Illinois, Iowa, Louisiana, Maine, Maryland, Michigan, Minnesota, Montana, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Texas, Virginia, Washington, Wisconsin) and 20 foreign countries (Argentina, Australia, Bolivia, Brazil, Canada, England, East Germany, West Germany, Iceland, India, Ireland, Israel, Kenya Netherlands, New Zealand, Norway, Peru, Poland, Russia, Sweden).

Dr. Donovan S. Correll's monographic treatment of the Solanum species Section Tuberarium titled "The Potato and its Wild Relatives" has been published by the Texas Research Foundation. Included are 178 species or 236 specific and intraspecific entities that are segregated into 32 series. All taxa proposed in the Section Tuberarium and all systematic work published through the year 1960 are considered in this treatise.

A supplement to the 1958 "Inventory of Tuber-Bearing Solanum Species" is being compiled and will be distributed to the technical workers interested in the breeding and improvement of potatoes. Accumulated evaluation data on currently available Solanum stocks will be reported in this publication. To improve seed longevity and extend the interval of time before regeneration becomes necessary, present seed stocks are being repackaged in metalized, heat-sealed, polyester film. This type of seed packet will constitute a more effective moisture barrier to the high humidity of refrigerated storage than the seed packet presently in use. A portion of all introductions thus packaged will be sent to the USDA National Seed Storage Laboratory, Fort Collins, Colorado.

EASTERN REGIONAL POTATO TRIALS, 1962

R. V. Akeley, F. L. Haynes, M. E. Gallegly, W. R. Mills, and A. E. Schark  
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In 1962, potato breeders of the eastern areas of the United States conducted comparative yield trials of their advance potato selections for the first time. The overall plan is to continue those tests in the future for adaptability and tuber qualities for fresh and processed uses. Each cooperator will plan to send any promising selection to Maine for increase for one year before it is entered in the regional trials.

Environmental Conditions: The tests were grown on Caribou loam soil in Maine and on clay loam soil in West Virginia. The season was variable in most areas. The trial at the University Farm in Pennsylvania suffered due to a record drought, especially the early-maturing varieties which were dead August 27. Only 0.8 inches of rainfall was recorded from June 25 to August 20. The environmental conditions at the Tidewater Research Station in North Carolina were very unsatisfactory for potato culture. Excessive rainfall occurred in Maine mostly during the planting and pre-harvesting periods. The growing season was on the cool side. In general, the growing season in West Virginia was cool throughout, with plenty of moisture up to mid-season followed by a slight drought until harvesttime. Planting and harvesting dates, row and seedpiece spacing, and fertilizer rates and rations for each State are listed below:

	<u>Date Planted</u>	<u>Date Harvested</u>	<u>Row Spacing</u>	<u>Seed Spacing</u>	<u>Fertilizer Per Acre</u>
Maine	May 14	Sept. 10	10 in.	36 in.	1200 (10-15-15)
North Carolina	March 30	July 9	12 in.	40 in.	1000 (10-20-20)
Pennsylvania	May 21	Sept. 17	9 in.	36 in.	1500 (5-10-5)
West Virginia	May 1	Sept. 12	10 in.	36 in.	1400 (5-10-10)

Results: The yields vary greatly between areas, due mostly to environmental factors. Seedlings WV 48-29, I 1412-WV 6, 4 QV-3, and Kennebec had the highest average yields for all locations (Northeastern table 1). Seedling 4XB-12 had the highest mean percentage of its tubers rated as U. S. No. 1 and B 3739-WV3 had the lowest with a percentage of only 81.

No selection in Northeastern table 2 had a mean rating of 19.7 for total solids which is considered the threshold for baking quality. Ona, with 17.9 per cent solids was the highest of the group. Seedling WV 48-39 was the latest in maturity. Seedling 50B33-3 and 50B43-4 ranked the earliest and were scored as very early in all locations.

Northeastern table 1. Yield per acre and percentages of U. S. No. 1 tubers.

Variety	Maine		N. C.		Penn.		W. Va.		Average	
	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.
W48-39	326	91	73	61	129	75	505	90	258	79
I1412-WV6	346	94	74	64	148	81	396	94	241	83
I1333-WV2	366	89	116	71	55	47	318	88	214	74
4XB-12	321	93	106	76	109	88	362	97	224	88
4SL-2	228	93	119	79	70	72	316	94	183	84
4QV-30	-	-	44	42	164	79	520	91	243	71
50B33-3	-	-	104	73	88	77	280	94	157	81
50B43-4	348	93	115	80	85	68	282	92	207	83
Ona	366	91	11	16	186	82	240	86	201	69
B3725-1	379	91	69	53	47	56	327	87	205	72
I. Cobbler	312	87	169	83	49	57	351	96	220	81
Kennebec	378	95	71	61	151	89	353	93	238	84
Katahdin	374	94	107	74	136	81	294	91	228	85
B3739-WV3	367	82	59	43	125	68	455	81	251	68

Northeastern table 2. Total solids<sup>1/</sup> and maturity<sup>2/</sup>

Variety	Percentages of Total Solids					Maturity Classes				
	Me.	N.C.	Penn.	W.Va.	Ave.	Me.	N.C.	Penn.	W.Va.	Ave.
	Pct.	Pct.	Pct.	Pct.	Pct.					
W48-39	19.4	13.1	18.8	18.4	17.4	5	5	5	5	5.0
I1412-WV6	18.6	12.0	18.6	15.4	16.1	5	5	5	4	4.7
I1333-WV2	16.7	13.3	19.7	17.6	16.8	1	1	1	3	1.5
4XB-12	19.2	14.8	21.2	17.5	18.2	4	5	4	4	4.2
4SL-2	16.9	15.0	20.9	17.1	17.5	1	4	1	3	2.5
4QV-30	-	13.3	18.2	18.2	16.6	4	3	5	5	4.2
50B33-3	-	12.2	19.4	16.7	16.1	1	1	1	1	1.0
50B43-4	16.7	11.8	19.2	15.8	15.9	1	1	1	1	1.0
Ona	18.4	-	18.6	16.7	17.9	4	4	5	4	4.2
B3725-1	16.0	14.1	20.5	16.2	16.7	1	2	1	3	1.7
I. Cobbler	18.2	13.9	19.4	15.6	16.8	1	2	1	1	1.2
Kennebec	19.7	12.2	20.7	16.7	17.3	2	5	4	4	3.7
Katahdin	18.2	12.9	19.2	16.5	16.6	4	4	4	3	3.7
B3739-WV3	18.0	13.5	18.8	17.1	16.8	1	5	5	4	3.7

<sup>1/</sup> From tables of M. Maerker - Landwerths.

<sup>2/</sup> Maturity: 1 = very early, 2 = early, 3 = medium, 4 = late, 5 = very late.



NORTH CENTRAL REGIONAL TRIALS - 1962  
R. H. Johansen, C. A. Nelson and Cooperators<sup>1/</sup>  
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This year (1962) was the twelfth year for the North Central Regional Potato Trials. These trials have been valuable for the evaluation of advanced breeding lines over a wide range of varied environmental conditions. In addition, it gives all cooperators an opportunity to become familiar with advanced breeding lines long before they are released as varieties.

Since these trials were initiated in 1951, twenty or more advanced selections tested in the North Central Regional trial have been released as commercial varieties. Varietal introductions in the past two years are as follows:

<u>Progeny No.</u>	<u>Year released</u>	<u>Released name</u>	<u>Intro-duced by</u>	<u>Parents</u>
B 3602-4	1961	Ona	USDA and Fla.	B2968-31 x B3021-3
Mich Ia 1111-5	1961	Emmet	Michigan	B595-76 x Ia 8724
Mich Ia 1111-8	1961	Arenac	Michigan	B595-76 x Ia 8724
Wisc 29	1961	Superior	Wisconsin	B96-56 x M59.44
La 42-45	1962	LaRouge	Louisiana	Red LaSoda x Progress
La 91-78	1962	LaChipper	Louisiana	Green Mt. x Cayuga
ND 3815-1R	1963	Viking	North Dakota	Redskin x Nordak
Neb 315.48-3X	1962	Pioneer	Nebraska	225-43-1 x Minn 113.43-1-45
T L 6219	1959 *	Catoosa	USDA and La.	TL 1859 selfed

\* - Released prior to being tested in the Regional Trial in 1961.

Environmental Conditions: The tests were conducted on peat soils in Indiana and Iowa. Upland soils at the other locations ranged from clay loam to loamy fine sand. Cultural practices (fertilizer application, irrigation, spray programs, vine killing, planting distance) are based on local conditions. Planting and harvest dates are listed below.

<u>State</u>	<u>Date Planted</u>	<u>Date Harvested</u>	<u>Total Days to Harvest</u>
Indiana	May 2	September 19	140
Iowa	May 1	September 27	149
Kansas	March 26	July 23	119
Louisiana	February 2	May 15	102
Michigan	May 23	October 4	134
Minnesota	May 31	September 12	104
Missouri	April 3	July 31	119
Nebraska	June 14	September 26	104
North Dakota	May 18	September 25	130
Ohio	June 12	October 26	133
South Dakota	June 6	October 4	120
Wisconsin	May 29	October 2	126

<sup>1/</sup> Indiana, J. Bowers; Iowa, J. Weigle; Kansas, J. Greig; Louisiana, J. Miller, J. Fontenot; Michigan, N. Thompson; Minnesota, O. Turnquist; Missouri, V. Lambeth; Nebraska, R. O'Keefe; North Dakota, R. Johansen; Ohio, G. Marlowe; South Dakota, K. Fisher; Wisconsin, S. Peloquin, D. Kichefski; USDA, R. Akeley, A. Schark, T. Dykstra.

The 1962 season was again variable for most areas. Temperatures in general were relatively cool and somewhat below normal in most of the northern states. In the South, temperatures were generally below normal for at least part of the growing season. Rainfall was sufficient in most all areas although some areas had limited rainfall during some part of the growing season. Examples of excessive rainfall and flooding were at Clear Lake, Iowa, where forty-four inches of rain fell in a 10-week period and at Baton Rouge, Louisiana, where 7 and one-half inches fell 20 days prior to harvest. This flooding naturally had a detrimental effect on the data from those areas. Other areas also had heavy rainfall during some part of the growing season that caused some damage to the trial.

Entries: Entries for the 1962 trials were received from Nebraska, Louisiana, Wisconsin, Michigan, USDA Maine, USDA Louisiana and North Dakota. The check varieties Red Pontiac and Norland were supplied by North Dakota while the check variety Cobbler was supplied by Iowa. Michigan and Wisconsin did not send their entries to Louisiana in 1962.

Yields: Early Group - La 61-125, a white-skinned selection, produced the highest average yield. This average yield was even higher than the early check varieties Norland and Cobbler. The average yields of Neb 315.48-3X (Pioneer) was quite comparable to Cobbler but slightly higher than Norland. No other early entry surpassed Cobbler or Norland in average yield.

Yields: Late Group - As in the past, the check variety, Red Pontiac, produced the highest average yield. Of the advanced lines, ND 3815-1R (Viking) and La 62-162 produced the highest average yield. However, the average yield of these two entries were approximately 80 cwt. per acre less than Red Pontiac. Other entries producing medium to high yields were ND 4524-7R and Wisc 56.

Maturity: Although not all states reported maturity ratings in 1962, no entries were earlier than the Norland early check variety and only one entry, MS 430-1L, was earlier than Cobbler. Only 2 entries, B 3602-4 (Ona) and La 62-162, were later in maturity than Red Pontiac.

Total Solids: Neb 156.51-2 produced the highest per cent total solids. TL 6937, Wisc 56, MS 425-2L, La 91-143, La 61-125, all surpassed Cobbler in average per cent total solids. Location again had a greater effect on total solids than did variety. Highest per cent total solids were found in North Dakota, followed by Ohio and South Dakota.

Scab Reaction: Michigan and Kansas showed no scab, while other states reported moderate to fairly heavy infestation of scab. Lowest incidence of scab was reported with the entry ND 4192-3. Wisc 372, Wisc 56 and La 62-162 also had a very low incidence of scab. With the exception of B 3604-1, which had the highest incidence of scab, all other entries had a much lower incidence of scab than Cobbler. Several entries expressed scab resistance comparable or better to the scab resistant check variety Norland which indicates that progress is being made in breeding for resistance to scab.



Internal and External Defects: Characters with possible weakness are starred to call attention. Some of these weaknesses may be more prevalent during a year of heavy rainfall and adverse weather conditions. For example, growth cracking and hollow heart were more prevalent during the 1962 season than in the 1961 season and this certainly may be attributed to the heavy rainfall in certain areas during a critical time of growth.

Overall Merit Ratings: Merit ratings are presented for the 1961 and 1962 seasons for possible comparisons.

	<u>1962</u>	<u>1961</u>
ND 4192-3	27	*
ND 3815-1R (Viking)	25	<u>23</u>
ND 4524-7R	22	—
La 61-125	18	—
B 3602-4 (Ona)	15	—

\* - Not entered in 1961

North Central table 1. Yields of U. S. No. 1

	Ind.	Iowa	Kans.	La.	Mich.	Minn.	Mo.	N.D.	Ohio	S.D.	Wisc.	Ave.	Yield
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Rank
<u>Early</u>													
Neb 315.48-3X	601		168	69	80	376	332	149	251	217	268	232	9
Neb 156.51-2	494		174	66	91	253	253	148	114	163	196	182	17
ND 4192-3	605		116	41	45	292	306	211	200	141	204	205	15
La 61-125	594		220	50	139	302	401	180	279	192	265	248	5
Cobbler	548		249	59	174	282	316	65	297	212	214	234	7-8
Norland	359		238	72	94	316	369	71	235	154	252	216	12
Wisc 372 <u>2/</u>	423		93	20	20	260	270	69	282	140	238	192	16
<u>Medium to Late</u>													
Neb 302.50-5	504		161	68	54	338	235	68	268	201	276	214	13
B 3604-1 <u>3/</u>	299			60	149	277	29	39	116	3	246	135	19
B 3602-4	484		65	48	198	336	172	39	317	152	280	208	14
ND 4524-7R	561		207	49	138	314	400	101	314	224	294	256	4
ND 3815-1R	699		217	102	81	385	376	120	320	256	230	275	3
La 62-162	690		117	59	169	466	296	81	393	246	323	277	2
La 91-143	505		145	44	99	397	287	65	291	190	250	225	10
T.L. 6937	424		95	79	32	291	171	55	218	129	210	164	18
T.L. 6894	330		236	98	113	338	294	89	257	213	214	217	11
Wisc 56 <u>2/</u>	632		166		78	356	251	65	201	168	237	241	6
M.S. 425-2L <u>2/</u>	476		77	240		358	290	69	163	140	256	234	7-8
M.S. 430-1L <u>2/</u>			46	47		287	217	25	98	59	189	126	20
Red Pontiac	962		255	116	210	501	419	77	318	434	377	360	1

1/ No yield data taken due to severe flooding.2/ Was not sent to Louisiana.3/ No yield taken in Kansas and Nebraska due to poor stand. Very poor stand in South and North Dakota.

North Central table 2. Maturity classification.

	<u>Ind.</u>	<u>Iowa</u>	<u>Kans.</u>	<u>La.</u>	<u>Mich.</u>	<u>Minn.</u>	<u>Mo.</u>	<u>Nebr.</u>	<u>N.D.</u>	<u>Ohio</u>	<u>S.D.</u>	<u>Wisc.</u>	<u>Ave.</u>
<u>Early</u>													
Neb 315.48-3X			3.1	3.0		2.2	4.0		3.0	2.6		3.0	3.0
Neb 156.51-2			4.2	4.0		2.2	2.8		2.0	2.6		1.8	2.8
ND 4192-3			4.1	2.0		2.0	3.1		2.0	1.0		1.0	2.2
La 61-125			4.5	1.5		1.2	4.0		2.8	2.4		1.7	2.6
Cobbler			3.0	2.0		1.0	2.3		2.0	2.5		1.5	2.0
Norland			1.9	1.5		1.0	2.0		1.0	1.0		1.0	1.3
Wisc W-372			2.5			1.8	2.8		2.0	2.8		1.4	2.2
<u>Medium to Late</u>													
Neb 302.50-5			3.1	2.5		2.0	3.1		2.8	3.2		2.5	2.7
B 3604-1			1.4	4.0		2.2	4.4		3.5	3.6		4.0	3.3
B 3602-4			4.1	4.0		3.8	4.4		4.5	4.0		4.8	4.2
ND 4524-7R			3.4	3.5		1.0	2.8		2.5	3.0		2.8	2.7
ND 3815-1R			4.2	4.0		2.2	3.1		2.8	3.7		1.8	3.1
La 62-162			4.2	4.5		3.8	4.0		4.0	4.0		5.0	4.2
La 91-143			4.0	3.0		3.0	4.0		2.3	3.8		3.0	3.3
TL 6937			2.9	3.0		2.5	3.0		3.8	3.5		3.0	3.1
TL 6894			3.8	3.0		2.8	2.8		3.3	3.8		3.0	3.2
Wisc 56			4.1			2.8	3.8		4.0	4.0		3.0	3.6
MS 425-2L			2.2			3.2	4.2		3.8	3.5		3.0	3.3
MS 430-1L			1.0			1.5	3.1		2.0	1.0		1.0	1.6
Red Pontiac			5.0	4.0		2.8	4.0		3.0	4.0		4.3	3.9

1/ = Very early - Warba maturity.

2/ = Early - Cobbler or Norland maturity.

3/ = Medium - Chippewa or Cherokee maturity.

4/ = Late - Katahdin or Kennebec maturity.

5/ = Very late - Red Pontiac or Sebago maturity.

North Central table 3. Total solids.

	<u>Ind.</u> Pct.	<u>Iowa</u> Pct.	<u>Kans.</u> Pct.	<u>La.</u> Pct.	<u>Mich.</u> Pct.	<u>Minn.</u> Pct.	<u>Mo.</u> Pct.	<u>Nebr.</u> Pct.	<u>N.D.</u> Pct.	<u>Ohio</u> Pct.	<u>S.D.</u> Pct.	<u>Wisc.</u> Pct.	<u>Range</u> Pct.	<u>Average</u> Pct.
<u>Early</u>														
Neb 315.48-3X	16.7	16.9	15.0	16.7	19.5	19.2	17.7	20.2	22.5	20.6	20.3	19.7	15.0-22.5	18.8
Neb 156.51-2	20.5	20.9	21.2	20.1	22.5	19.9	20.7	19.6	23.9	24.2	21.8	21.2	19.6-24.2	21.4
ND 4192-3	17.1	16.9	15.2	17.3	18.8	16.4	16.9	19.7	22.3	19.2	19.2	19.2	15.2-22.3	18.2
La 61-125	16.9	16.2	19.2	19.0	17.8	17.8	19.0	20.4	22.7	20.4	20.7	19.4	16.2-22.7	19.1
Cobbler	17.1	15.0	18.2	18.8	17.8	18.0	18.6	20.7	22.0	20.6	19.7	19.9	15.0-22.0	18.9
Norland	14.1	18.2	15.8	16.7	17.0	17.5	15.6	18.9	20.2	18.5	18.4	18.0	14.1-20.2	17.4
Wisc W-372	15.4	15.6	18.2		17.4	18.0	18.2	18.5	20.7	19.4	19.7	18.2	15.4-20.7	18.1
<u>Medium to Late</u>														
Neb 302.50-5	17.1	18.4	16.2	17.3	19.6	18.1	18.8	17.7	21.9	20.4	19.7	19.4	16.2-21.9	18.7
B 3604-1	13.9	15.8		17.1	17.6	17.5			19.5	17.9		18.4	13.9-19.5	17.2
B 3602-4	16.9	18.2	13.9	16.7	19.7	18.5	17.3	17.4	21.2	21.5	19.2	19.4	13.9-21.5	18.3
ND 4524-7R	15.0	16.4	14.5	17.3	18.5	17.5	16.0	19.6	21.9	19.2	18.4	18.6	14.5-21.9	17.7
ND 3815-1R	15.6	16.0	15.8	17.5	19.6	19.8	18.6	17.3	20.9	20.0	19.2	18.2	15.6-20.9	18.2
La 62-162	15.8	16.0	14.1	17.1	18.8	17.8	16.5	16.2	20.5	19.6	18.0	19.0	14.1-20.5	17.4
La 91-143	17.7	18.4	17.1	17.7	18.5	20.0	19.4	19.3	22.7	20.6	19.9	18.4	17.1-22.7	19.1
TL 6937	18.2	19.2	16.7	19.0	19.5	19.5	20.7	20.0	22.7	21.5	20.9	18.8	16.7-22.7	19.7
TL 6894	17.1	18.4	14.8	16.9	19.2	20.8	17.5	19.3	23.3	20.4	19.7	19.7	14.8-23.3	18.9
Wisc 56	17.5	18.2	18.6		19.8	18.8	18.4	19.3	22.8	21.7	20.1	20.3	17.5-22.8	19.6
MS 425-2L	16.7	16.7	19.7		19.6	17.8	21.4	20.3	22.2	21.5	20.9	19.0	16.7-22.2	19.6
MS 430-1L			14.3		15.5	16.8	15.0		18.7	17.9	16.5	16.7	14.3-18.7	16.4
Red Pontiac	15.4	15.4	14.1	16.0	17.8	18.8	15.4	17.7	20.7	18.3	18.2	18.2	14.1-20.7	17.2
Average	16.6	17.2	16.5	17.6	18.7	18.4	18.0	19.0	21.7	20.2	19.5	19.0		

----- Highest per cent total solids.

----- Lowest per cent total solids.



North Central table 4. Scab reactions reported<sup>1/</sup>

	<u>Ind.</u>	<u>Iowa</u>	<u>Kans.</u>	<u>La.</u>	<u>Mich.</u>	<u>Minn.</u>	<u>Mo.</u>	<u>Nebr.</u>	<u>N. D.</u>	<u>Ohio</u>	<u>S. D.</u>	<u>Wisc.</u>
<u>Early</u>												
Neb 315.48-3X	1-3	T-1	0-0	1-2	0-0	1-4	0-0	3-5	2-3	2-3	2-3	3-4
Neb 156.51-2		T-2	0-0	1-1	0-0	1-4	0-0	3-5	1-2	1-2	T-1	3-4
ND 4192-3		1-1	0-0	1-1	0-0	T-1	0-0	1-1	T-1	1-1	0-0	0-0
La 61-125	1-2	2-2	0-0	1-1	0-0	1-4	0-0	2-5	T-1	1-1	1-1	3-3
Cobbler	1-3	2-3	0-0	0-0	0-0	2-5	0-0	3-5	2-3	1-1	1-1	3-5
Norland		2-2	0-0	1-1	0-0	1-3	0-0	1-4	T-1	1-1	T-1	1-2
Wisc W-372	1-1	1-2	0-0		0-0	1-2	0-0	2-1	1-1	T-0	0-0	0-0
<u>Medium to Late</u>												
Neb 302.50-5	1-2	2-3	0-0	1-1	0-0	1-3	0-0	2-4	2-2	1-1	1-2	0-0
B 3604-1	2-2	3-3		2-2	0-0	1-3	0-0		4-2	1-2	3-2	2-2
B 3602-4	1-1	1-1	0-0	3-2	0-0	1-1	0-0	2-3	2-3	1-1	0-0	2-2
ND 4524-7R	1-1	2-2	0-0	1-1	0-0	1-3	0-0	3-5	1-2	T-0	T-1	0-0
ND 3815-1R	1-1	1-2	0-0	0-0	0-0	2-2	0-0	2-5	1-1	T-0	1-1	1-2
La 62-162	1-2	1-1	0-0	0-0	0-0	T-1	0-0	2-1	1-1	2-3	T-1	2-2
La 91-143	1-1	T-1	0-0	1-1	0-0	1-4	0-0	2-5	1-1	T-0	1-1	4-5
TL 6937	1-1	2-2	0-0	1-1	0-0	1-2	0-0	3-1	1-2	T-1	2-1	2-2
TL 6894	1-1	T-1	0-0	0-0	0-0	2-4	0-0	2-5	1-1	T-1	0-0	2-3
Wisc 56	1-3	T-1	0-0		0-0	1-1	0-0	2-2	1-1	T-0	T-2	0-0
MS 425-2L	1-1	1-3	T-2		0-0	1-2	0-0	1-5	1-1	1-1	1-1	2-2
MS 430-1L			1-3		0-0	1-1	0-0	2-1	2-2	1-2	1-1	0-0
Red Pontiac	1-3	2-3	0-0	1-1	0-0	2-4	0-0	2-4	2-2	1-2	T-1	2-3

1/

Area	Type
T = less than 1%	1 = small, superficial
1 = 1 - 20%	2 = larger, still superficial
2 = 21 - 40%	3 = large, rough pustules
3 = 41 - 60%	4 = large pustule, shallow holes
4 = 61 - 80%	5 = large pustule, deep holes
5 = 81 - 100%	

North Central table 5. Summary of grade defects (internal and external).

	Scab Pct.	Growth Cracks Pct.	Second Growth Pct.	Sun Green Pct.	Total <sup>1/</sup> free of Ext.Def. Pct.	Hollow Heart Pct.	Internal Necrosis Pct.	Vasc.* Disc Pct.	Total <sup>1/</sup> free of Int.Def. Pct.
<u>Early</u>									
Neb 315.48-3X	28.1	3.1	6.2*	10.2	58.1	3.4*	3.1	10.0	84.3
Neb 156.51-2	19.2	1.3	3.2	7.7	71.6	1.1	3.8	12.2	83.2
ND 4192-3	10.0	1.4	2.8	2.4	83.8	1.9	.6	5.8	92.0
La 61-125	22.4	.3	3.3	12.3	67.5	.4	.8	11.7	87.1
Cobbler	35.2*	1.3	6.8*	7.5	55.1	4.2*	4.9*	17.2*	76.2
Norland	22.8	3.7	1.2	1.3	72.3	.7	1.8	6.0	91.5
Wisc W-372 1/	14.8	6.1	2.6	15.5	67.3	0	2.9	5.6	92.2
<u>Medium to Late</u>									
Neb 302.50-5	21.2	1.9	1.7	8.8	70.2	1.0	2.2	10.8	86.3
B 3604-1 2/	51.9*	18.7*	1.6	12.1	29.3	4.7*	1.1	13.4*	81.0
B 3602-4	28.4	1.2	1.3	7.8	64.8	1.2	3.7	9.4	86.6
ND 4524-7R	21.6	9.0	.9	2.1	70.4	.1	5.8*	13.4*	80.8
ND 3815-1R	24.6	6.8	5.5	2.3	66.4	.2	.8	9.2	89.2
La 62-162	15.8	24.3*	5.2	1.4	58.6	.5	1.9	4.4	93.2
La 91-143	28.4	4.1	4.6	12.7	52.9	.6	1.3	10.4	86.6
TL 6937	23.3	1.4	1.0	11.9	69.6	2.4	3.2	7.9	87.0
TL 6894	20.2	4.7	2.0	3.4	71.0	1.0	2.5	16.9*	79.7
Wisc 56 1/	13.5	6.6	3.1	6.8	72.9	.5	2.3	10.8	86.5
MS 425-2L 1/	27.4	3.4	3.0	7.5	65.0	7.6*	2.2	10.5	80.7
MS 430-1L 2/	25.4	8.0	.9	6.4	59.3	1.6	.4	2.3	95.7
Red Pontiac	26.4	1.2	2.2	1.3	70.6	2.7	1.0	7.8	88.8

1/ Average - 11 locations.

2/ Average - 9 locations.

\* - Possible weakness in variety.

North Central table 6. Merit rating<sup>1/</sup>

	<u>Ind.</u>	<u>Iowa</u>	<u>Kans.</u>	<u>La.</u>	<u>Mich.</u>	<u>Minn.</u>	<u>Mo.</u>	<u>Neb.</u>	<u>N.D.</u>	<u>Ohio</u>	<u>S.D.</u>	<u>Wisc.</u>	<u>Ave.</u>	<u>Merit Rank</u>
<u>Early</u>														
Neb 315.48-3X		2			4		1						7	
Neb 156.51-2													0	
ND 4192-3	5	3				4	3	5	5		2		27	1
La 61-125	3		5	2			5					3	18	4
Cobbler			4							3			7	
Norland			1				4						5	
Wisc W-372		1											1	
<u>Medium to late</u>														
Neb 302.50-5	1											1	2	
B 3604-1													0	
B 3602-4		5			5	3						2	15	5
ND 4524-7R				1	1	5			4	2	5	4	22	3
ND 3815-1R	4	4	2	5				4	2	4	4		25	2
La 62-162							2	2	3	4	1		10	
La 91-143	2							1					4	
TL 6937				4									5	
TL 6894			3	3		2		3	1		3		11	
Wisc 56													4	
MS 425-2L					3					5			8	
MS 430-1L					2	1							3	
Red Pontiac										1		5	6	

1/ Merit points determined as follows:

<u>Merit rating</u>	<u>Merit points</u>
1	5
2	4
3	3
4	2
5	1

PACIFIC NORTHWEST

Aberdeen, Idaho

L. L. Sanford and K. W. Knutson

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The objective of the cooperative USDA-University of Idaho potato breeding program is the development of varieties with resistance to the common scab, verticillium wilt, "eumartii wilt" (Fusarium solani f. eumartii), early blight, and leaf roll; and with horticultural characteristics such as high yields, and good quality for processing and fresh use. One specific objective in the program is the selection of varieties with long, russeted tubers.

In 1962 thirty seven parental clones, selected for their disease resistance and horticultural attributes were crossed in 184 combinations. Seed production was excellent. In May 1962, 15,256 seedling tubers, 12,501 from the Aberdeen program and 2,755 from the USDA, were planted in the field. One hundred and fifty-two were selected for further testing. A total of 293 clones were planted in five-hill plots. These included 60 Aberdeen and 233 USDA clones. From these 39 were selected for further tests. In addition 38 clones were tested in ten-hill plots with 12 being selected.

Seed stock of all clones is grown at the Tetonia Branch Station, which is 6200 feet in elevation. The high elevation, plus isolation from the potato producing areas makes it possible to produce disease-free seed. In 1962, 109 clones were increased.

A winter-index program was established in 1962. Small seed pieces, cut from tubers of first year seedlings grown and selected at Aberdeen, were planted on the University of Arizona Mesa Branch Station, Mesa, Arizona, February 1. Disease readings were taken on April 11 when the plants were 8-10 inches tall. A total of 550 hills were planted and of these 46 percent were judged to be healthy, 30 percent appeared infected with leafroll, and 24 percent were questionable. The seed pieces were treated with gibberillin at 10ppm and resulted in a considerable amount of abnormal growth, which might have contributed to the low percentage of plants rated healthy. Seedlings grown at Aberdeen in 1962 were treated with a soil application of systemic insecticides in an attempt to reduce the spread of leafroll. Tubers indicated to be free of disease in the Arizona test were planted for increase at Tetonia. Less than one percent of these were rogued-out during the summer.

Aberdeen Yield Trial. This test included 23 clones with Russet Burbank, Menominee, and Early Gem as check varieties. Twenty-hill plots, with 11 inch seed-piece spacings, were used. The plots were replicated 4 times in a randomized, complete block design. The soil type was a loam and 160 pounds per acre of 16-20-0 fertilizer was applied. Results of this test are shown in Idaho table 1. Some of the more promising clones in this test are: A175-7, round to oblong russeted tuber with medium deep eyes, good yield and quality, late maturity; A463-4, oblong to long russeted tuber, shallow eyes, high solids, medium maturity; A492-2, oblong to long russeted tuber, shallow eyes, high solids, late maturity; A469-4, round russeted tuber, shallow eyes, medium-late maturity; A483-17, long russeted tuber, medium-shallow eyes, late maturity; and A487-27, round russeted tuber, shallow eyes, late maturity.



Egin Bench Yield Trial. The Egin Bench is near Rexburg, Idaho, and is unusual in having a very light, sandy soil which is heavily infested with Verticillium albo-atrum. The area is under sub-irrigation. Due to abnormally cool summer temperatures in 1962, the severity of Verticillium wilt was substantially reduced in this area. The yield trial included 18 clones with Russet Burbank and Menominee as check varieties. A randomized, complete block design with ten-hill plots, replicated four times, was used. Results of this trial are presented in Idaho table 2. Total yields were above average and percent solids below average. Four clones, A483-17, A576-2, A378-2, and A594-11 were outstanding in their resistance to Verticillium wilt. These four lines appear to be late to very late in maturity, and therefore, rather than having true resistance, may have resistance due to lateness. Determining maturity of clones, when they are subject to Verticillium infection, is difficult.

Aberdeen Duplicate Ten-Hill Trial. This trial consisted of two ten-hill plots for each of 47 lines and 3 check varieties, Russet Burbank, Menominee, and Early Gem. A randomized, complete block design was used. This test is the first attempt in the breeding program to evaluate yielding ability. The results are given in Idaho table 3. Some of the more promising lines are: A589-65, long russeted tuber, slightly pointed, late maturity; A598-3, long russeted tuber, shallow eyes, late maturity; A598-101, long russeted tuber, late maturity; A587-27, round to oblong russeted tuber, shallow eyes, late maturity; A501-7, long russeted tuber, slightly pointed, late maturity; and A483-6, long russeted tuber, somewhat small, late maturity. Twenty-eight of the 47 lines had a higher No. 1 yield than Russet Burbank.

Common Scab Trial. This trial is conducted in the Rockford, Idaho area where a number of fields are seriously infested with scab. Although the Russet Burbank has moderate resistance, it scabs severely in this area. The 1962 trial included 14 Minnesota clones, 19 USDA clones, and 30 Idaho clones. A completely randomized design with two-hill plots, replicated twice, was used. The results are presented in Idaho table 4. The average reading for all Minnesota lines was 2.74-3.96<sup>1/2</sup>; USDA lines, 2.58-4.13; and Idaho lines, 2.88-3.50. Sixty-four percent of the Minnesota clones showed type 5 scab, as did 90 percent of the USDA, and 40 percent of the Idaho clones. All but one of the Idaho clones have russeted skin to a varying degree. Outstanding scab resistance was shown by B3457-2 with a zero reading in both replications. Several other clones superficial type scab, rated as 1 or 2.

Early Blight Trial: This trial included 44 lines and varieties with Russet Burbank planted in every other row. A randomized, complete block design with five-hill plots, replicated three times, was used. On July 23 and about August 10, potato leaves infected with Alternaria solani were spread among the Russet Burbank plants. The plot was sprinkler irrigated from 2 to 4 hours every other day after inoculation. The results are given in Idaho table 5. The 1962 test was less severe than in 1961. Infection progressed slower, and with a killing frost occurring on September 7, it was possible to take only one reading. Table 6 gives the results of the 1961 and 1962 tests on 29 USDA and Idaho clones. These were planted as single 5-hill plots both years. Although the percentage of defoliation was less in 1962, the relative rank of the lines is quite consistent between the 2 years, indicating the test is a fairly reliable estimate of each clone's relative early blight resistance.

Idaho table 1. Aberdeen yield trial, 1962.

Clone	No. 1 Yield		Total Yield per acre	No. 1's		Undersize		Rough	Specific Gravity	Verticillium	
	Cwt.	per acre		Pct.	Cwt.	Pct.	Pct.			Index1/ Scab2/	Area Type
A175-7	289.7		352.8	82	12	5			1.082	18	T-5
A503-42	281.0		369.5	76	17	7			1.088	20	2-5
A597-25	251.2		338.3	74	15	11			1.085	27	2-5
A170-9	238.1		336.1	71	11	18			1.080	27	0-0
A491-2	233.8		318.7	73	20	7			1.091	26	0-0
A463-4	233.0		304.9	76	14	9			1.084	41	0-0
Menominee	230.1		288.9	73	12	8			1.089	18	0-0
A610-101	228.0		310.0	74	9	17			1.083	23	0-0
A627-30	212.0		356.5	59	22	18			1.080	9	1-5
A610-102	211.3		287.5	73	9	18			1.081	11	0-0
A492-2	207.6		288.2	72	20	8			1.092	13	0-0
A469-4	201.8		279.5	72	19	9			1.087	15	0-0
A477-11	196.7		292.6	67	24	9			1.089	29	0-0
A496-4	193.1		261.4	74	19	7			1.089	7	0-0
A483-17	193.1		286.8	67	13	20			1.082	13	0-0
A466-2	188.8		254.8	74	15	11			1.089	10	0-0
A487-27	186.6		293.3	64	26	10			1.076	22	0-0
Russet Burbank	168.4		281.0	60	17	23			1.083	52	0-0
A378-2	166.2		243.9	68	18	13			1.083	13	0-0
Early Gem	155.4		238.1	65	9	25			1.072	90	0-0
A380-5	153.2		254.1	60	20	19			1.088	10	0-0
A576-2	149.5		278.8	54	26	20			1.081	4	0-0
A603-27	137.9		228.7	60	32	7			1.083	80	0-0
A465-8	122.7		182.9	67	19	14			1.079	15	T-2
A495-6	79.9		253.4	31	58	11			1.090	3	2-4
A594-11	68.2		270.1	25	68	7			1.094	20	0-0
L.S.D. .05	40.0		34.8						0.006		
L.S.D. .01	53.0		46.5						0.009		

1/Percentage of foliage affected

2/Area (Percent tuber surface area affected) Type - Scale 1-5; 1, very small and superficial; 5, pitted scab

T - Trace

1 - 1-20

2 - 20-40

3 - 40-60

4 - 60-80

5 - 80-100

Fusarium solani f eumartii - Inoculated Field Test. Thirty-one clones were tested for resistance to "eumartii wilt." They were planted in a randomized, complete block design with 3-hill plots replicated three times. At the time of planting each seed piece was dipped in a slurry of agar, water and fungus growth. Several different isolates of the fungus were used to make a composite inoculum sample. The results are presented in Idaho tables 7 and 8.

Six foliage readings were taken during the summer, with each plant rated separately. A mean of the 3 plants in each plot was used in the analysis. Russet Burbank was the most tolerant in foliage expression, although not significantly different from 12 of the 30 other clones. Cayuga, Ontario, and Seneca have been reported to have tolerance, but appeared to have little in this test. Although some clones had a relatively low wilt index, all lines had a high percentage of infected tubers, with the lowest being A495-6 with 67 percent. There is some correspondence between the wilt index and the percentage of infected tubers, with the lower index generally associated with relatively fewer tubers infected. The differential response of this group of clones was much greater in foliage expression than in tuber infection.

1/ Scab rating system as given in table 4.

Idaho table 2. Egin Bench yield trial, 1962.

Clone	No. 1 Yield per acre	Total Yield per acre	No.1's	Under- size	Rough	Specific Gravity	Verticillium Index <sup>1/</sup>
	Cwt.	Cwt.	Pct.	Pct.	Pct.		
A503-42	288.9	469.0	62	30	8	1.075	47
A175-7	278.8	424.0	66	23	11	1.066	48
Menominee	275.9	374.6	74	20	6	1.073	20
A597-25	255.5	416.7	61	29	10	1.071	46
A610-102	245.5	379.0	65	19	16	1.066	29
A610-101	222.1	406.6	55	17	28	1.071	39
A463-4	216.3	339.8	64	32	4	1.069	65
A170-9	210.5	379.0	55	25	20	1.071	33
A491-2	199.0	384.8	52	31	17	1.072	59
A477-11	196.0	348.5	51	42	7	1.072	65
Russet Burbank	171.3	329.6	52	34	14	1.072	63
A483-17	167.0	339.8	49	19	32	1.069	9
A465-8	152.5	271.5	56	30	14	1.075	56
A576-2	151.0	302.0	50	31	19	1.073	4
A627-30	143.7	332.5	43	43	13	1.067	12
A492-2	140.8	281.7	50	34	16	1.073	14
A466-2	126.3	296.2	43	20	37	1.074	24
A378-2	124.9	259.9	48	30	22	1.069	5
A469-4	124.9	294.7	42	40	18	1.073	24
A594-11	103.1	230.9	45	50	5	1.077	5
L.S.D. .05	69.6	65.6				0.005	
L.S.D. .01	92.9	87.3				0.006	

1/Percentage of foliage affected.



Idaho table 3. Aberdeen duplicate 10-hill trial, 1962.

Clone	No. 1 Yield per acre	Total Yield per acre	No. 1's	Specific Gravity	Verticillium Index <sup>1/</sup>
	Cwt.	Cwt.	Pct.		
A561-5	386.2	437.0	88	1.071	14
A605-7	316.5	376.1	84	1.090	6
A594-3	283.1	332.5	85	1.087	15
A573-5	278.8	347.0	80	1.074	5
Menominee	277.3	320.9	86	1.078	4
A556-2	274.4	338.3	81	1.079	4
A579-11	271.5	360.0	75	1.086	5
A600-101	265.7	334.0	80	1.081	3
A574-6	254.1	320.9	79	1.072	14
A607-20	254.1	351.4	72	1.093	14
A575-7	246.8	338.3	73	1.089	8
A610-103	242.5	310.7	78	1.084	8
A374-3	232.3	322.3	72	1.079	2
A579-104	232.3	312.2	74	1.073	7
A580-2V	228.0	338.3	68	1.084	13
A574-18	226.5	312.2	73	1.076	4
A598-3	225.0	309.3	73	1.076	9
A582-10	223.6	315.1	71	1.082	15
A535-4	213.4	287.5	74	1.086	8
A583-7	209.1	363.0	58	1.085	14
A501-13	207.6	265.7	78	1.081	3
A594-19	203.3	322.3	63	1.092	4
A589-65	200.4	296.2	68	1.092	3
A598-101	198.9	320.9	62	1.084	23
A579-9	196.0	278.8	70	1.087	6
A607-105	190.0	345.6	55	1.090	10
A465-11	188.8	265.7	72	1.087	15
A539-5	187.3	291.8	64	1.067	5
A592-16	184.4	275.9	67	1.076	10
A589-41	181.5	284.6	64	1.080	9
Russet Burbank	181.5	286.0	63	1.086	23
A575-100	180.0	296.2	61	1.079	20
A501-7	178.6	248.3	72	1.089	14
A535-9	178.6	307.8	58	1.090	6
A627-17	174.2	325.2	54	1.081	33
A589-31	172.8	326.7	53	1.077	8
A587-27	172.8	241.0	72	1.070	5
A573-101	168.4	228.0	74	1.077	13
A600-8	168.4	275.9	61	1.084	4
A610-19	158.3	286.0	55	1.084	11
A483-6	156.9	242.5	65	1.085	18
A589-43	153.9	239.6	64	1.084	15
A576-5	152.5	320.9	47	1.070	8
A627-29	146.6	309.3	48	1.082	9
Early Gem	143.7	251.2	57	1.068	80
A595-15	129.2	245.4	53	1.077	33
A538-2	129.2	255.5	50	1.083	13
A376-19	108.9	194.6	56	1.075	21
A603-35	103.1	249.7	41	1.080	8
A597-3	45.0	178.6	25	1.071	8
L.S.D. .05	65.8	59.0		0.007	
L.S.D. .01	87.7	78.7		0.010	

<sup>1/</sup> Percent of foliage affected.



Idaho table 4. Common scab trial, Rockford, Idaho, 1962.

Clone	Rep. I		Rep. II		Clone	Rep. I		Rep. II	
	Area <sup>1/</sup>	Type <sup>2/</sup>	Area	Type		Area	Type	Area	Type
16.54-10	3	3	-	-	A175-7	3	4	2	4
18.55-1	1	4	2	4	A378-2	1	1	1	2
18.55-23	3	5	T	1	A380-5	T	3	1	1
20.55-5	5	5	2	4	A463-4	3	4	2	3
32.54-7	4	3	4	3	A465-8	4	5	4	4
52.54-10	2	5	1	5	A465-11	4	5	5	5
54.54-7	1	5	4	5	A466-2	4	5	3	5
69.49-4	2	3	1	3	A469-4	2	4	4	5
79.53-3	5	5	-	-	A477-11	2	4	4	4
79.53-11	2	4	4	5	A483-17	T	1	3	4
81.53-10	4	5	T	1	A487-27	4	3	5	4
91.53-11	T	3	1	3	A491-2	T	2	1	2
109.49-2	1	5	3	4	A492-2	2	3	3	3
162.52-3	3	5	5	5	A495-6	5	4	4	4
B3352-8	4	5	5	5	A496-4	5	5	5	5
B3401-25	4	4	4	4	A503-42	4	5	4	5
B3427-7	5	5	4	5	A574-6	3	4	2	5
B3692-4	3	4	5	5	A576-2	2	3	2	4
B3819-17	3	5	3	5	A579-11	4	4	4	5
B4094-21	1	3	3	5	A580-2V	1	2	1	3
B926-9	4	5	5	5	A594-3	2	4	2	2
B3457-2	0	0	0	0	A594-11	2	1	1	3
B3726-6	1	1	1	5	A595-15	0	0	T	1
B4312-21	3	5	3	4	A497-25	4	5	5	5
B4088-4	3	5	5	5	A603-27	3	4	4	5
B4094-9	4	5	0	0	A610-19	4	3	T	1
B4094-18	2	5	1	5	A610-101	4	4	3	4
B4580-1	3	5	2	5	A610-102	2	3	5	5
B4804-1	3	5	1	5	A610-103	4	3	3	4
B4804-11	3	5	3	5	A627-30	5	4	5	5
B4805-1	1	5	T	4	Russet Burbank	4	5	3	4
B4807-1	2	5	T	2	Cobbler	5	5	5	5
B4871-3	1	5	T	1	Early Gem	2	4	1	2
A170-9	T	2	2	2	Katahdin	3	5	3	5

<sup>1/</sup> Area (Percent tuber surface area affected).

T = Trace

1 = 1-20

2 = 20-40

3 = 40-60

4 = 60-80

5 = 80-100

<sup>2/</sup> Type - Scale 1-5: 1, very small and superficial  
5, pitted scab

Idaho table 5. Early blight test, 1962

Clone	September 4 Defoliation $\frac{1}{2}$ Pct.	Clone	September 4 Defoliation Pct.
A496-4	4.0	Ona	10.0
A465-8	2.0	A463-4	10.0
A495-6	2.0	A170-9	10.0
A380-5	2.0	A477-11	10.0
A466-2	2.0	A492-2	10.0
A503-42	2.0	A491-2	12.0
A465-11	2.0	A594-3	12.0
Menominee	2.0	A597-25	15.0
A580-2V	3.0	Katahdin	19.5
A469-4	3.0	A610-101	19.5
A175-7	4.5	Superior	23.5
Kennebec	4.5	Russet Burbank	25.0
A579-11	4.5	Snowflake	28.0
A576-2	4.5	A574-6	28.0
A594-11	4.5	A610-19	28.0
Russet Sebago	6.0	Navajo	35.0
A483-17	6.0	Red Pontiac	46.0
A610-102	6.0	Early Gem	54.0
A487-27	6.0	Onaway	59.5
A378-2	6.0	A595-15	59.5
A610-103	6.0	A603-27	65.0
Mohawk	7.5	Cobbler	85.0
A627-30	7.5		
L.S.D. .05			10.0
L.S.D. .01			17.5

$\frac{1}{2}$ /Calculated from the Barratt and Horsfall system of rating plant diseases.  
Horsfall, J. G. and R. W. Barratt. 1945. An improved grading system for  
measuring plant diseases. Phytopathology 35:655.

Idaho table 6. Early blight trial, 1961 and 1962.

Clone	Sept. 4 1962 Pct.	Aug. 22 1961 Pct.	Sept. 2 1961 Pct.	Mean 1961 Pct.	Relative Rank 1962	Relative Mean Rank 1961
B3948-5	2.0 $\frac{1}{2}$	6.0	40.5	23.2	1	7
B3983-2	2.0	2.0	12.0	7.0	1	3
A465-8	2.0	4.0	8.5	6.3	1	2
A495-6	2.0	12.0	31.0	21.5	1	6
A465-11	2.0	6.0	8.5	7.3	1	4
A469-4	3.0	2.0	6.0	4.0	2	1
A175-7	4.5	8.5	50.5	29.3	3	9
A378-2	6.0	12.0	31.0	21.5	4	6
B3959-3	6.0	2.0	12.0	7.0	4	3
B3980-3	6.0	23.5	98.0	60.8	4	17
A477-11	10.0	23.5	91.5	57.5	5	15
B3956-1	12.0	12.0	23.5	17.8	6	5
B3813-27	12.0	12.0	40.5	26.2	6	8

continued

Idaho table 6, continued.

B3955-2	12.0	23.5	59.5	41.5	6	11
B3983-5	12.0	6.0	59.5	32.8	6	10
B3976-1	23.5	23.5	98.0	60.8	7	17
B3982-7	23.5	12.0	76.5	44.2	7	12
Russet Burbank	25.0	18.5	84.0	51.3	8	13
B3813-2	40.5	40.5	98.0	69.3	9	18
B3970-1	40.5	23.5	94.0	58.8	9	16
B3956-6	40.5	40.5	98.0	69.3	9	18
B3969-1	40.5	23.5	98.0	60.8	9	17
B3977-4	40.5	23.5	98.0	60.8	9	17
B3868-2	40.5	12.0	76.5	44.2	9	12
B3864-5	40.5	23.5	98.0	60.8	9	17
B3879-3	59.5	23.5	98.0	60.8	10	17
B3956-5	76.5	40.5	98.0	69.3	11	18
B3813-22	76.5	23.5	98.0	60.8	11	17
B3963-5	76.5	12.0	98.0	55.0	11	14
B3960-1	81.5	23.5	98.0	60.8	12	17
Mean	25.6	17.3	66.0	41.7		

1/ Percent defoliation.

Idaho table 7. Fusarium solani f. eumartii inoculated field test, 1962

Clone	Wilt Index 1/						Mean
	June 23	July 5	July 14	July 27	Aug. 6	Aug. 21	
Russet Burbank	0.0	0.3	1.1	2.1	2.2	2.2	1.31
A576-2	0.0	0.3	0.9	1.7	2.0	3.0	1.31
A378-2	0.0	0.4	0.7	2.1	2.7	3.1	1.50
A483-17	0.1	0.9	1.6	2.0	2.1	3.0	1.61
Early Gem	0.0	0.9	1.4	2.0	2.5	3.4	1.70
A487-27	0.1	0.4	1.9	2.6	2.9	3.2	1.85
A597-25	0.1	1.1	2.0	2.2	3.0	3.1	1.91
A610-101	0.0	0.3	1.9	2.7	3.1	3.7	1.95
A503-42	0.0	1.2	2.1	2.4	3.2	3.4	2.05
A603-27	0.2	1.0	2.1	2.7	2.8	3.6	2.06
A491-2	0.1	0.9	2.4	2.9	3.1	3.0	2.06
A380-5	0.0	1.3	2.1	2.3	3.3	3.7	2.11
A495-6	0.6	1.2	1.9	2.9	2.9	3.1	2.11
A170-9	0.1	0.4	2.1	2.8	3.7	3.7	2.13
Menominee	0.0	1.1	2.8	2.9	3.0	3.1	1.15
Onaway	0.1	0.4	2.3	3.0	3.3	3.9	2.16
A594-11	0.0	1.4	2.2	2.7	3.2	2.7	2.20
Cayuga	0.0	0.3	3.0	3.0	3.3	4.0	2.26
A463-4	0.1	0.4	2.0	3.3	3.9	4.5	2.36
A466-2	0.3	2.1	2.6	2.8	3.2	3.8	2.46
Ontario	1.0	1.3	2.0	3.3	4.3	3.7	2.60
A496-4	0.0	1.6	2.9	3.7	3.7	3.9	2.63
A492-2	0.4	1.0	2.8	3.7	4.0	4.4	2.71
A627-30	0.9	2.2	3.4	3.3	3.3	3.5	2.76

continued

Idaho table 7, continued.

Seneca	1.0	1.8	2.8	3.0	4.2	4.0	2.80
A477-11	0.1	2.0	3.2	3.9	3.7	4.0	2.81
A469-4	0.3	2.4	3.6	3.8	4.1	3.9	3.01
A465-8	0.8	1.8	3.4	4.0	4.0	4.3	3.05
A610-102	0.1	1.6	3.0	4.6	4.7	4.7	3.11
A175-7	0.7	2.4	3.6	4.2	4.6	4.9	3.40
A465-11	1.2	3.7	4.3	4.6	4.6	4.7	3.85
Mean	0.27	1.23	2.39	3.01	3.37	3.68	2.32
L.S.D. .05							0.80
L.S.D. .01							1.05

1/ Wilt Index scale

- 1 = Trace
- 2 = 5-50% foliage affected
- 3 = 50-80% foliage affected
- 4 = 80-100% foliage affected
- 5 = Plant dead

Idaho table 8. Fusarium solani f. eumartii inoculated field test, 1962..

August 21 Reading			
Clone	Tubers infected	Clone	Mean 1/ wilt index
		Russet Burbank	2.2
A495-6	66.6	A495-6	2.8
A463-4	77.5	A483-17	3.0
Russet Burbank	79.4	A491-2	3.0
A469-4	79.4	A576-2	3.0
A627-30	79.8	A597-25	3.1
A603-27	87.2	Menominee	3.1
A170-9	87.5	A378-2	3.1
A378-2	88.3	A487-27	3.2
A487-27	88.6	A503-42	3.4
A597-25	90.1	Early Gem	3.4
Onaway	90.5	A627-30	3.5
A503-42	93.0	A603-27	3.6
A610-101	93.6	A170-9	3.7
A466-2	93.9	A594-11	3.7
A594-11	93.9	A380-5	3.7
A576-2	93.9	A610-101	3.7
A483-17	93.9	A466-2	3.8
Menominee	94.9	Onaway	3.9
A477-11	96.8	A469-4	3.9
A465-11	97.0	A477-11	4.0
Early Gem	97.6	A465-8	4.3
A380-5	97.9	A492-2	4.4
A491-2	100.0	A463-4	4.5
A465-8	100.0	A496-4	4.6
A175-7	100.0	A465-11	4.7
A496-4	100.0	A610-102	4.7
A610-102	100.0	A175-7	4.9
L.S.D. .05	26.2	L.S.D. .05	1.3
L.S.D. .01	30.6	L.S.D. .01	1.7

- 1/ Wilt index scale: 1 = Trace 4 = 80-100% foliage affected  
 2 = 5-50% foliage affected 5 = Plants dead  
 3 = 50-80% foliage affected



SOUTHEASTERN POTATO PROJECT  
(Louisiana Headquarters)  
T. P. Dykstra  
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The growing season of 1962 was favorable for potatoes in most of the southern states and a satisfactory yield and good quality were obtained.

Performance of New Variety and Advanced Seedling Varieties

Certified seed potatoes planted in the South for table stock production are shipped from the North. A newly developed seedling tested in the South for adaptability and found to be promising must also be tested for performance in the northern seed-producing areas. If a variety cannot be produced profitably in the North, seed growers will not be interested in growing it. For this reason a new variety established in the South must also be well adapted to growing conditions in the North.

In September 1962 observations were made and growers reactions were obtained on a recently released variety and on a number of advanced seedlings growing in commercial fields in northern states.

Catoosa - The Catoosa variety was released in 1959. It is now commercially grown as certified seed in North Dakota, Wisconsin, Wyoming, Washington and the Netherlands. Where this variety is well adapted its yield is high and its tuber shape and color are satisfactory. In a field in Wisconsin the skin color was a deep red. A forty acre field of certified seed of Catoosa, grown at Gilby, North Dakota, was observed. The grower was satisfied with its yield, tuber shape, color and high scab resistance as well as its storage quality, which he considered superior to most varieties. The tubers retained their firmness in storage late in the spring and sprout development also was delayed.

A grower at Grafton, North Dakota was highly pleased with the performance of Catoosa and its quality and noted that it possessed high resistance to flea beetle damage.

Catoosa was observed in a field in Wyoming where the soil was heavily infested with the scab organism. The resistance of Catoosa was striking here in comparison to that of other varieties. A grower of Catoosa (certified) in Wyoming expressed his preference of this variety because of its superior storage quality, and scab resistance. He considered the yield of Catoosa as high or higher than that of any other variety he was growing.

In heavy soils or extremely light soils the skin color around the eyes of Catoosa tends to fade.

TL 6937 - At St. Thomas, North Dakota seedling TL 6937 looked superior. Almost every hill in a 1 1/2 acre field produced from 4 to 5 large oblong tubers with shallow smooth eyes, without a blemish, and with almost 100 percent U. S. No. 1 tubers. If this performance was typical in other areas this seedling would meet the requirements for a new variety. In other areas of Wisconsin and Nebraska it has also given a very satisfactory performance.

TL 6937 is highly resistant to scab and blight, is high in solids, and is an excellent baker and chipper. Its tuber set is not too heavy, which often results in lower yields. In some soil types tubers of TL 6937 are not too uniform. Additional tests are needed to determine the feasibility of releasing it as a variety.

TL 6894 - This seedling, immune from the common strain of the late blight organism, looked good when grown in North Dakota and Wisconsin. Its tuber skin color is a deep red and in the light soils of Nebraska it was one of the few red varieties that retained its bright red color. It is earlier in maturity than Catoosa. Its skin is firm and immature even when harvested. Its scab resistance is inferior to that of Catoosa. Additional tests on this seedling variety will have to be made.

Both TL 6937 and TL 6894 were included in the North Central Regional Test of 1962. Among the other advanced seedlings growing in northern states, TL 7627, TL 6896 and TL 7935 looked very good from the standpoint of yield and tuber appearance. These seedlings will be included in the 1963 North Central Regional Test.

#### Potato Breeding at the Cumberland Plateau, and Increase Problems

The climatic conditions in 1962 were quite ideal for seed setting at the Cumberland Plateau in Tennessee. A large number of seedballs were developed from crosses made in the seed plot.

A number of parents possessing quality factors needed in developing potato varieties for the South are now available. They are used in relatively few combinations and fewer family lines with larger populations when grown. This method is preferred over that of crossing and growing out many family lines with low populations.

Seed from crosses made in June are planted the same year during the last week of August in an air conditioned section of the Louisiana State Experiment Station greenhouse at Baton Rouge, and are harvested around Christmas. The practice, initiated 2 years ago, of screening harvested greenhouse seedlings very closely on the basis of vigor and desirable tuber appearance continues to be highly satisfactory. All tubers of each selection grown in 3-inch pots in the greenhouse are saved and stored. The following April the tubers of these are planted for increase in isolation at the Cumberland Plateau Experiment Station, Crossville, Tennessee.

The desirable seedlings are selected at harvest in August. Under favorable growing conditions the best seedlings yield from 15 to 20 pounds of tubers. This constitutes the yield from one true seed obtained from a cross made only 14 months previously. Only a fraction of the total yield from each seedling is saved to be planted next year for increase and maintenance at Crossville, Tennessee. The remainder is taken to Louisiana to be planted in January at 3 different locations.

The seedlings are harvested again in May and reselected on the basis of yield, tuber shape, color and disease resistance. Selections that meet preliminary requirements are saved and stored at 70° F., preliminary to planting again in August at the Branch State Experiment Station at Clinton, Louisiana.

Most of the land around Baton Rouge consists of a heavy alluvial clay loam with poor external and internal drainage. In September, torrential rains accompanied by high temperatures may occur, causing ideal conditions for development of tuber rot. Under such conditions almost 100 percent of the seed tubers planted may rot before sprouting. These climatic conditions along with poor soil drainage make it impossible to carry on a consistent fall potato program.

At the newly acquired station at Clinton, the soil is a sandy loam with good drainage which almost eliminates the tuber rot problem in fall planting. Additional facilities are also available for convenient overhead irrigation.

During the fall season plants in the fields are examined frequently for occurrence of disease and are rogued if necessary. The seedlings are harvested in early December and their tubers are stored at 60° F. In May dormancy is broken and the tubers of each seedling are ready to be planted for increase in northern states.

This procedure has greatly accelerated the increase of tubers of promising seedlings. If true seed is planted immediately after the seedballs are harvested and if full advantage is taken of every available opportunity to increase the seed tubers it is possible under our setup to obtain an increase of 300 lbs. or more of disease-free tubers from only one seed obtained from a cross made 30 months previously.

Dykstra table 1. Seedling yields at Baton Rouge, Louisiana, 1962<sup>1/</sup>

Accession Number	Parentage	U.S.No. 1	Average
		Tubers per acre	solids
		Bu.	Pct.
3815-1R <sup>3/</sup>		286	17.5
LaRouge <sup>3/</sup>		283	16.9
LaSoda <sup>4/</sup>		280	16.5
TL 6896 <sup>2/</sup>	2910-1 x B 3309-8	266	17.7
TL 7935	2910-1 x B 3309-8	257	17.3
TL 7918	A-119-8 x B 3099-5	257	16.0
TL 6875 <sup>2/</sup>	2910-1 x B 3309-8	257	17.3
TL 6894 <sup>3/</sup>	2910-1 x B 3309-8	236	16.9
Catoosa <sup>3/</sup>		230	16.7
TL 7788	A-119-8 x B 3099-5	227	
TL 6894 <sup>5/</sup>	2910-1 x B 3309-8	224	16.9
Catoosa <sup>4/</sup>		221	16.7
TL 6894 <sup>4/</sup>	2910-1 x B 3309-8	220	16.9
TL 7888	A-119-8 x B 3099-5	216	15.2
TL 8040	TL 6896 x TL 1859	206	19.4
TL 6543	B 2368-4 x B 2997-9	202	19.2
N.D. 4122-2		198	18.8
TL 7716	A 119-8 x B 3099-5	189	18.2

continued



Dykstra table 1, continued

TL 6937	B 792-88 x B 962-32	171	19.0
TL 7828	A 119-8 x B 3095-5	166	17.1
TL 8076	TL 3769 x BL 1079-11	166	17.1
TL 7936	2910-1 x TL 1859	166	19.4
TL 8033	TL 6896 x TL 1859	162	18.8
TL 8041	TL 6896 x 3309-8	124	15.6
TL 8054	TL 6937 x TL 3769	115	16.7
ND 3842 <sup>3/</sup>		106	
L.S.D. 5%			58.7

1/Average of 3 replications of 40 plants, each spaced 12 inches apart in rows 4 feet wide.

2/Seed tubers obtained from Maine.

3/Seed tubers obtained from N. Dakota.

4/Seed tubers obtained from Wisconsin.

5/Seed tubers obtained from Nebraska.

Remainder came from Tennessee.

Dykstra table 2. Seedling yields at Diamond, Louisiana, 1962<sup>1/</sup>

Accession Number	Parentage	U. S. No. 1 Tubers per acre	Average Solids
		Bu.	Pct.
TL 7935	2910-1 x TL 1859	391	19.2
TL 7627	A 606-37 x Cherokee	362	20.1
TL 6543	B 2368-4 x B 2997-9	319	20.5
Catoosa <sup>3/</sup>		319	17.1
TL 6875	2910-1 x TL 3309-8	304	18.8
LaRouge		297	17.3
TL 6937	B 792-88 x B 962-32	275	20.3
TL 6894 <sup>2/</sup>	2910-1 x TL 3309-8	254	17.9
TL 7653	A 119-8 x B 3099-5	224	19.7
TL 6937	B 792-88 x B 962-32	210	20.3
Catoosa <sup>4/</sup>		210	17.1
N.D. 3842 <sup>3/</sup>		196	
TL 7936	2910-1 x TL 1859	188	21.6
TL 7923	605-10 x TL 1859	152	19.2
L.S.D. 5%			37.6

1/Average of 5 replications of 25 plants each, spaced 12 inches apart in a row 4 feet wide.

2/Seed tubers obtained from Maine.

3/Seed tubers obtained from North Dakota.

Remainder came from Tennessee.



Dykstra table 3. Seedling yields at New Roads, 1962<sup>1/</sup>

Accession Number	Parentage	U. S. No. 1 Tubers per acre	Average Solids
		Bu.	Pct.
TL 8033	TL 6896 x TL 1859	333	17.9
TL 6896 <sup>2/</sup>	2910-1 x 3309-8	327	17.5
LaRouge <sup>3/</sup>		306	17.6
TL 6543	B 2368-4 x B 2997-9	300	18.6
TL 8054	TL 6937 x TL 3769	287	20.7
TL 6894 <sup>2/</sup>	2910-1 x 3309-8	263	
TL 6937 <sup>2/</sup>	B 792-88 x B 962-32	253	20.5
N.D. 3815-1R <sup>3/</sup>		253	18.4
TL 7918	A 119-8 x B 3099-5	240	16.2
TL 7716	A 119-8 x B 3099-5	193	16.9
N.D. 3842 <sup>3/</sup>		81	
L.S.D. 5%			65.9

<sup>1/</sup>Average of 3 replications of 40 plants each, spaced 12 inches apart in a row 6 feet wide.

<sup>2/</sup>Seed tubers obtained from Maine.

<sup>3/</sup>Seed tubers obtained from North Dakota.  
Remainder came from Tennessee.

U. S. - COLORADO POTATO EXPERIMENT STATION, GREELEY, COLORADO  
S. A. Alfieri, Jr.  
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The establishment of a potato isolation plot at the Cheyenne Horticultural Field Station (CFS) shows much promise from the standpoint of low incidences of insect populations which are involved as virus vectors. The CFS has certain areas which are heavily infested with the common scab organism. Seedling selection and increase plus the establishment of a scab plot are in progress at this station.

Cooperative potato research projects with State Cooperators are being continued at the Greeley Station as well as observation and field testing.

Breeding. The breeding program continues to emphasize superior horticultural lines with adequate resistance to leafroll, common scab, early and late blight, *Verticillium*, and chipping as one of the processing qualities. An expanded program for disease-testing to Virus S and X is underway.

Known clonal lines with reported low levels of reducing sugars have been used in interspecific crosses. These progenies will be grown and tested for chipping ability and resistance to net necrosis.

Late blight has occurred again during the 1962 growing season in moderate proportions in certain areas of Colorado. Some serious losses occurred in storages. Isolations for race determination is being continued. Preliminary work reveals that  $R_4$  is prevalent in this area.

First Year Seedlings. A total of 45,000 first year seedlings representing the progenies of 130 families were planted in the field as single hills during the 1962 growing season. Of this number approximately 15,000 were produced at Greeley, 5000 at Beltsville, Maryland, 2500 at Aberdeen, Idaho, and 22,500 at Prosser, Washington, all of USDA origin. Based on horticultural characters the following number of seedling selections were made: 632 (4.5%), 201 (4.2%), 76 (3.1%), 664 (2.7%), respectively--a sum total of 1573 individuals.

First year seedlings were grown in the San Luis Valley and at the Cheyenne Horticultural Field Station. The selections will be planted in 10-hill lots at the CFS for selection and increase.

10-Hill Seedling Lots. Ninety-six 10-hill seedling selections were made out of a total of 791 which were single hill plantings the previous year. These selections will be replanted at the CFS in 10-hill units for further observation and selection followed by testing for disease resistance.

Advanced Selections. All seedlings surviving by continued selection generally beyond the third year are increased for seed which is utilized for yield trials.

Disease Testing. Common scab of potato is still a relatively important disease. However, the production of disease resistant varieties have minimized the seriousness of this disease and continued effort is placed on producing superior potato varieties with high levels of resistance to the common scab organism.



A scab nursery plot for testing seedling lines and standard varieties as checks was established in Gilcrest, Colorado, on a farm (Mr. Henry Walters) known to have a long history of scab infestation. The results of the scab test for 1962 are presented in Greeley table 1. A *Verticillium* wilt test plot was established at the CFS to test seedling lines developed from the breeding program. The seed piece dip method was used. No results of this test were secured because a severe frost in early September destroyed all the top growth before symptoms appeared.

Leafroll resistance testing was conducted by alternately planting 2 test hills and 2 leafroll-infected hills in the field at Greeley. This test plot was subjected to normal horticultural practices including the regular disease control program as practiced by growers in the area. Indexing of the test lines for leafroll symptoms has not been completed. The data will be reported next year.

Resistance to viruses S and X determined serologically and with test plants will be a regular part of the program in testing for disease resistance.

Cooperative Research Projects. Various cooperative research projects with potatoes are being conducted between this Station and the Colorado Agricultural Experiment Station of Colorado State University at Fort Collins, Colorado. (CSU)

Vascular Wilts and Internal Discolorations of Potatoes as Affected by Environmental Factors and Cultural Practices. This study was made between the Department of Botany and Plant Pathology, Colorado State University and the U. S.-Colorado Potato Experiment Station, Greeley, Colorado. The cooperators in the Department are Mr. Clark H. Livingston and Drs. Monty D. Harrison and Nagayoshi Oshima.

This cooperative study was conducted at the U. S.-Colorado Potato Experiment Station, Greeley, Colorado during the 1962 season to determine the effects of environmental factors and cultural practices on the incidence of wilt and internal discolorations of potatoes.

The studies made in 1962 consisted of 3 experiments, (1) an irrigation experiment in which the effects of soil moisture and temperature on wilt diseases was determined; (2) a chemical seed treatment experiment to measure the effects of various chemicals on the incidence of wilt and seed piece decay, (3) a date of planting experiment in cooperation with the experimentations of the Department of Horticulture, CSU.

Soil Moisture and Soil Temperature. Russet Rural potatoes were planted on May 16 and 17. Each plot consisted of 4 rows 530 feet long. The experiment was replicated twice. Five irrigation schedules were employed beginning on June 25. One irrigation per week served as a standard and approximated the normal irrigation schedule for potatoes in the area. Two irrigations per week and one irrigation every 2 weeks constituted the 2 extremes (wet and dry) in the experiment. Two additional treatments in which the plants received the normal irrigation schedule (once per week) until flowering time followed by either a twice per week schedule or a once every 2 weeks schedule were employed. These treatments were intended to provide moisture stress (either high or low moisture) during the latter part of the growing season when tubers were being formed.

Relative moisture levels and soil temperatures were measured with tensiometers and recording soil thermographs installed in each sub plot of one replication.

The moisture fluctuations were measured at a depth of 8-9 inches and the soil temperatures at seed piece depth (5-6 inches).

Wilt notes were taken by counting the number of wilted plants per 100 feet in the center 2 rows of each sub plot. Yields were determined by harvesting the rows on which wilt notes were taken. A one hundred-fifty pound sample from each sub plot was taken at the time of harvest for determination of the amount of internal discoloration present and for use in studies on the effect of storage conditions on the development of internal discolorations.

Ten plants from each sub plot, a total of 100 plants, were collected at random on August 31, 3 weeks before any wilt symptoms were evident. Isolations were made from these plants to determine the presence of wilt pathogens even though symptoms were not evident.

Common weed species in the plot were also collected and checked for their ability to harbor wilt pathogens.

A severe hail storm devastated the plots on June 29. Nitrogen at the rate of 60 pounds per acre was applied to the plot with irrigation water on July 9 to aid the recovery of the damaged plants. These 2 factors apparently delayed the expression of wilt symptoms long past the time of their normal occurrence. First wilt symptoms were found in the plots receiving the twice per week irrigation schedule on September 20 at which time other plots appeared relatively healthy.

Wilt notes on September 22 showed 68.4% of the plants irrigated twice per week to be wilted while 30.5% of the plants showed wilt which were irrigated once per week and only 23.7% of those irrigated once every 2 weeks were wilted. Plants receiving heavy amounts of water following flowering showed 26.4% wilt and 49.5% of those receiving the dry treatment following flowering were wilted. Notes taken on September 29 showed the same general trend with wilt percentages ranging from 84.8% in plots kept constantly wet to 30.7% in plots receiving the dry treatment.

Soil temperature data show little difference in soil temperature between the 5 irrigation schedules indicating that soil moisture was the primary factor in determining the amount of wilt and the time of symptom expression.

The data further indicate that high soil moisture during the entire season and probably especially during the first part of the season is most likely to result in early appearance of wilt.

The conclusion that high soil moisture during the early growth of the plant favored infection by the fungus and hence the greater amount of wilt seems to be precluded by the fact that Verticillium, the fungus primarily responsible for the wilt in 1962, was isolated from plants from all treatments with equal frequency at least 3 weeks before any symptoms were evident. The fungus in most cases had completely invaded the vascular tissue and could be isolated from the base to the top of the plants with relative ease.



Yields were evidently not influenced to a great degree by wilt since it occurred so late in the season. Plants grown under the high moisture level yielded an average of 265 pounds of No. 1 potatoes per 200 feet of row compared to 250 pounds for the once a week irrigation and 202 pounds for the once every 2 weeks irrigation. Plants receiving high moisture following flowering yielded 220 pounds and those kept dry after flowering yielded 242 pounds.

Leak and late blight infection in the tubers increased markedly in both wet treatments. The tubers produced under the constant dry conditions were very rough and growth-cracked excessively.

The lack of correlation between amount of wilt and yield is believed due to the delay of symptom development as a result of the severe hail damage and the application of nitrogen. Yields would probably have been more meaningful had symptoms developed a month earlier.

Examination of tubers harvested from the above plots for internal discoloration due to the wilt pathogens showed a tendency for the amount of discoloration to be inversely proportional to the amount of wilt in the plot. Tubers from the plot receiving 2 irrigations per week showed 9.5% internal discoloration at harvest time while those from plants receiving the once per week irrigation showed 16.2% and those from the once every two weeks schedule showed 20.6%. Conclusions from these findings are not possible at present; however, it appears that conditions favoring the development of foliar symptoms of *Verticillium* wilt may not favor the development of internal discolorations in the tubers produced by infected plants.

*Verticillium* was isolated from 2 to 8 species of weeds (i.e. Portulaca oleracea L. and Chenopodium berlandieri Moq.) commonly found in potato fields in the Greeley area.

Chemical Seed Treatment. Seven chemical seed treatments were applied to Russet Rural seed pieces to determine their effects on seed piece decay and surface-borne *Verticillium* inoculum.

Captan, 2,4,5-trihydroxybutriphenone (THBP), Semesan Bel (as a dust and a dip) and combinations of Semesan Bel (dust), Captan and an experimental fungal agent, DJ-400 with THBP were used as treatments. Untreated cut seed and whole seed served as controls. The chemical 2,4,5-trihydroxybutriphenone (THBP) was a treatment used in other experiments. (See National Potato Breeding Program Report, 1961).

Captan was used as a 7.5% dust, THBP as a 0.25% dust and Semesan Bel as a 7.5% dust and as a dip at the rate recommended by the manufacturer. All necessary dilutions were made using Pyrax as a carrier.

Freshly cut seed pieces were placed in a closed container with enough dust to cover the cut surfaces and rotated to distribute the material. The treated seed pieces were stored in open paper bags and planted the day following treatment. The Semesan Bel dip treatment was made immediately before planting.

Each treatment was replicated 3 times. Each replicate consisted of one row 60 feet long. Sixty treated seed pieces were planted per row. Planting was done on May 16, 1962 in soil ideally suited for planting and emergence data was

collected on June 20, nine days before the plot was hailed. A second set of emergence notes was taken on August 1, one month after hail to determine the ability of the plants to recover after severe hail damage. Notes on relative vigor of the plants, degree of suberization of the cut surface, amount and type of rot and the amount of shrinkage and chemical injury were also taken on June 20.

Wilt notes were taken on September 22 by counting the number of plants showing Verticillium wilt symptoms.

The plot was harvested on October 8 and the yield of the center 40 feet of each 60 foot row was determined.

Emergence data taken June 20 showed that only the Semesan Bel dust and Semesan Bel dust plus THBP reduced emergence significantly. Emergence in these two Semesan Bel dust treatments was less than 30 per cent. Relative plant vigor on June 20 was greatest with uncut whole seed and least with Semesan Bel dust and Semesan Bel dust plus THBP. The Captan, the Captan plus THBP and THBP plus DJ-400 treatments had vigor readings slightly lower than the cut seed control and the THBP treatment indicating a possible delay in emergence.

The vigor of the uncut whole seed remained outstanding during the entire season. The Captan, Captan plus THBP and THBP plus DJ-400 treated plants though less vigorous early in the season tended to "catch up" and could not be distinguished from other treatments by the end of the season.

Suberization was good with all treatments including the untreated seed indicating ideal soil conditions at planting time. It was especially good in the case of Semesan Bel dust and THBP increased suberization slightly over the untreated seed.

The amount of decay present on June 20 was greatest in the case of the untreated cut seed and was reduced markedly by all treatments. No rot was observed in the case of the uncut whole seed. Isolations showed most rot to be caused by species of *Fusarium* although some bacterial decay was found.

Shrinkage and chemical injury was excessive only when Semesan Bel was used as a dust treatment either alone or in combination with other materials.

Emergence (recovery) readings taken after the hail revealed slight decrease in stand in the THBP and THBP plus DJ-400 treatments when compared with the whole seed check. The recovery was, however, as good as other chemical treatments and the cut seed check. The Semesan Bel dust treatments were still very poor in emergence but slightly better than the emergence on June 20, indicating that part of the poor showing early may have been due to greatly delayed emergence.

Wilt counts revealed no differences among treatments with respect to percentage of plants infected with *Verticillium* wilt.

Yield data showed that Semesan Bel dust alone or in combination with other chemicals reduced yields significantly. This can be accounted for by the greatly reduced stands where this material was used.



THBP and THBP plus DJ-400 treatments reduced yields slightly when compared to the whole seed check. They were, however, equal to the cut seed check, Captan, Captan plus THBP and Semesan Bel dip. They were higher in yield than both Semesan Bel dust treatments. The slight yield reductions by THBP and THBP plus DJ-400 appears to be a result of slightly reduced recovery following the hail damage.

The ideal soil conditions at planting time apparently served to mask a good deal of the effect of seed treatments during the 1962 season. Had unfavorable conditions for the healing of cut surfaces prevailed the results of the experiment would probably have been different. The fact that more invasion of the seed piece by fungi and bacteria occurred in the case of the untreated seed piece indicates that conditions more favorable for decay development and less favorable for rapid sprouting and emergence may have made some of the treatments highly beneficial.

Semesan Bel as a dust treatment proved to be very detrimental to the cut seed and should not be used. Semesan Bel as a dip treatment, however, proved to be as good as any treatment in the study.

Inoculum of Verticillium albo-atrum borne on the surface of seed pieces appears to be of little or no consequence in the area of northern Colorado. Seed treatments with chemicals that have shown reduction of wilt elsewhere had no effect in this experiment. These results indicate that soil-borne inoculum is the most important source of infection at Greeley.

Date of Planting Study. The Russet Rural variety was planted on 3 dates, April 30, May 21, and June 15, 1962 in cooperation with the Department of Horticulture to determine the influence of this factor on wilt expression and internal discoloration. Each planting date was replicated three times.

The hail storm of June 29 reduced the stand greatly. Wilt symptoms did not appear before harvest time and no wilt notes could be taken.

The plots were harvested September 27 and samples were taken for determination of the amount of internal discoloration.

At harvest time tubers from the early date of planting showed 11% fungus type discoloration and no net necrosis while those from the middle and late dates showed 9% and 10% fungus discoloration respectively, and no net necrosis. Five weeks later it was found that no net necrosis was present in tubers from the early date of planting stored at 50° F. from the middle planting date tubers showed 35% net necrosis and those from the late date showed none.

It appears from these data that date of planting had little effect on fungus invasion of tubers but may have an important bearing on leafroll net necrosis. This will be investigated further in 1963.

Control of the Green Peach Aphid on Potatoes. This cooperative research study is a continuance of work initiated by Mr. L. E. Jenkins in 1959 of the Department of Entomology, Colorado State University, Fort Collins, Colorado and is presently being conducted by Dr. Robert G. Simpson of the same department with the U. S.-Colorado Potato Experiment Station at Greeley. This trial was conducted at the Greeley Station and both field and greenhouse readings for leafroll symptoms were made by Dr. S. A. Alfieri, Jr.

Chemical Spray Trials - 1961. Pontiac foundation seed was used in the 1961 trial plots. Experimental insecticides consisted of Dimethoate, Thiodan, Guthion and Thimet. Thimet, applied with a Gandy applicator in the furrow at planting time, was used in 2 treatments, one of which had a second midseason foliar application. Each plot contained 8 rows 600 feet long. Two replicates were all that available space allowed. The plots were sub-divided into 10 sampling areas, with 10 leaf counts made in each area. Counts in the 4 center rows alternated with applications at weekly intervals throughout the season. The results are shown in Greeley table 2. Both Thimet treatments showed evidence of slight control 60 days following the application. The plot receiving the midseason application on August 1 gave reasonably good control until about September 1.

Chemical Control and Leafroll Incidence. It would appear that the effectiveness of chemicals in controlling aphids could be correlated with the amount of leafroll showing up in plants when tubers from those plants were planted the following year. To test this hypothesis, 2400 tubers (200 from each replicate plus checks ranging from small to large in size) were collected at random in two lots at harvest. One lot planted during the winter in the greenhouse and serving as a check for field stock avoided environmental influences and virus transmission. The second lot, planted in the field with numbered aluminum tags inserted into tubers prior to planting and recovered from the seed piece when leafroll symptoms appeared, identified the specific treatment. Field and greenhouse leafroll readings were taken at several intervals as plants neared maturity.

Greeley table 2 shows the number of leafroll-infected plants from field plots as compared to those grown in the greenhouse, their respective treatments, rates per acre, total aphids and the percent control of each treatment. You will note that the single application of Thimet and Guthion giving the least amount of control resulted in fewer infected plants than did Dimethoate or Thiodan, which gave the best controls. There is no apparent explanation for this fact. The comparative field and greenhouse tests substantiate field leafroll readings. No significant differences were found between greenhouse and field leafroll readings. The test showed no correlation between chemical effectiveness and the amount of leafroll appearing in tubers planted the following season.

Chemical Spray Trials - 1962. The procedure used in 1962 was the same as past years. The potato variety was changed to Blanca since it is very susceptible to leafroll and symptoms are easily discerned. According to both plot counts and weekly samplings the aphid population was about one-half of that in 1961 as shown in Greeley table 3.

Both Thiodan and Systox gave excellent control in 1962. The results, as shown by Dimethoate, are somewhat misleading. Of the total 34 aphids, 25 were found on a single leaf near the soil surface, on the last counting date, thus giving a higher count than usual for this chemical. Di-Syston, a granular material, applied in the furrow at planting time received no further sprays and showed a high total count. This material gave good aphid control from early June to early August.

The Effect of Potato Seed Size and Spacing on Yield and Grade. This experiment was conducted between the late Dr. Harold W. Chapman, Horticulture Department, Colorado State University, and the Greeley Station. Other cooperative projects include date of planting, maximum performance test, and date of harvest.



Seed sizes of .1 lb. and .2 lb. each were planted as cut and whole seed at a spacing of 7" and 14" between hills. Varieties used in the test were Early Gem, Kennebec, Haig and Norland. All were planted May 1st at the potato station at Greeley. The test plantings were severely hailed on June 29th which must be considered on evaluating the results. Poor stands were obtained with Norland due to condition of the seed at planting time. The plots were harvested September 20th.

In general, higher total yields were obtained with the .2 lb. whole and cut seed at the 7" spacing. The Early Gem variety produced higher yields and more No. 1 potatoes at the 7" spacing with .2 lb. whole seed. Kennebec also produced highest yield with the .2 lb. whole seed at the 7" spacing but the throw outs were also higher. The Haig variety produced the highest yields on the .2 lb. whole seed at the 7" spacing and a lower grade out than other varieties. The Norland seed planted resulted in poor stand so that it is difficult to fully evaluate the yields. The amount of seed required for .2 whole or cut seed at the 7" spacing would be nearly double that of the .1 lb. weight seed at the narrow spacing.

Greeley table 4 shows the results, keeping in mind that the severe hail storm of June 29th may have altered results over previous years. The results indicate the importance of changing the cultural practices for different or new varieties.

Maximum Performance Test. The objective of this experiment was to use all of the recommended practices for growing potatoes to obtain the highest possible yields. Irrigation was considered to be the critical limiting factor and was included as the variable. One series of plots were irrigated once a week, and the second series twice a week. All other growing practices were uniformly applied in the same manner to each series of plots. The design permitted a measurement of the effect of tractor wheel effects on yield. Tractor-drawn equipment was used weekly as compared to no tractor wheel effects in a series of plots.

The two varieties used, Norland and Early Gem, were planted May 1. Potatoes were planted after alfalfa, 20 tons of barnyard manure applied and an application of 120-360-30 lbs., of a complete fertilizer was side dressed at planting time. The potato vines grew vigorously and on June 29th were completely hailed down. Following this damage, 60 lbs. of nitrogen per acre was applied in the irrigation water. Row irrigation commenced on June 21 on a once and twice per week schedule, preceded by a pre-plant irrigation due to dry soil conditions previous to planting. The potatoes were harvested on September 20, and records taken on yield and grade out. Only total yields are reported at this time.

This year the difference in yield due to the effect of tractor wheel compaction was very small and probably not significant. Last year large differences were obtained and this may be associated with the heavy rainfall conditions which prevailed during the 1961 season.

The difference due to irrigation effect was very high this season and the severe hail damage of June 29 may be a factor here in the rate of recovery associated with irrigation effects. Results will vary with weather conditions from year to year.

Date of Planting. The objective was to determine the relationship of planting dates to specific gravity, percentage of reducing sugars, chipping color, and total yield. Blanca, Early Gem, Katahdin, Norland and Russet Rural were planted April 27, May 18, and June 15 at the U. S.-Colorado Potato Experiment Station, Greeley, Colorado. The seed was from that produced at the San Luis Valley Branch Experiment Station, Center, Colorado, and as uniform seed pieces as possible were used for each variety. Cultural practices and spray schedules were uniformly applied to all varieties on all planting dates.

The entire field was severely damaged by a hailstorm on June 29, and this must be considered in comparing yield and grade data. The potato vines were reduced to stubs, and the stage of growth of the different varieties at that date may be a factor in the rate of recovery from the damage.

The data on specific gravity, percentage of reducing sugars and chip color are presented in Greeley table 6. The specific gravity was low on Early Gem and Norland (1.060) varieties and held about the same at all planting dates. The specific gravity readings on Blanca, Katahdin and Russet Rural were high, and there were no important differences between planting dates and specific gravity changes. Reducing sugars in all varieties were lowest on May 18, medium on April 27, and highest on the late June 15 planting date. Norland and Early Gem were high in reducing sugars, although Norland had lower reducing sugars on the June 15 planting date. Chipping color readings indicated highly acceptable quality with Blanca, Katahdin, and Russet Rural at all planting dates. Early Gem was not acceptable in quality at any planting date, whereas Norland chipped well at the June 15 planting date only.

The yields of early and medium harvest dates are low, undoubtedly reflecting the rate of recovery from hail damage. The yield and grade associated with the late planting date indicate the relationship of stage of growth of the potato vines to improved yields after the hail damage. These data on total yields for the 5 varieties are presented in Greeley table 7.

Date of Harvest. Blanca, Early Gem, Katahdin, Norland and Russet Rural varieties were all planted on the same date, May 11. The seed was obtained from stock grown at the San Luis Valley Station. Uniform seed pieces were used in the planting of each variety with uniform spacing of 12" between hills and 36" rows. The crop was uniformly irrigated and sprayed on a regular schedule.

Three replications were planted with each variety for each harvest date in 2-row plots, 50 feet long. The potatoes were scheduled for harvest as follows: Early Harvest--September 3, Medium, September 20, and Late Harvest--October 10. The yields for each of the 5 varieties are shown in Greeley table 8.

The potatoes were hailed severely on June 29, and this must be considered in the table of results. The yields may reflect the rate of varietal recovery from the hailstorm damage. The stage of growth of each variety at the time of the hailstorm may be a factor in comparing the yield relationships.



Greeley table 1. Common scab test of potato lines in plot at Gilcrest, Colorado.

Pedigree	1st Rep.	2nd Rep.	Fe Cl <sub>3</sub> Test*	Pedigree	1st Rep.	2nd Rep.	Fe Cl <sub>3</sub> Test*
Ona (B3602-4)	tr	1-1	2	G229-2	2-1	2-1	2+
B4608-8	0-0	3-1	3	G232-3	2-2	1-3	3+
B4752-1	3-1	3-2	2+	G233-3	1-1	1-1	2
" -2	4-1	3-2	3	G234-1	2-1	1-1	2+
" -7	4-1	4-2	3	" -10	2-1	1-1	2
B4803-9	2-1	3-2	2	" -15	2-1	1-1	2+
B4809-2	3-1	4-2	2+	" -17	0-0	3-2	3
" -9	2-1	2-1	1	G235-1	2-1	2-1	2
B4811-4	3-1	tr	3	G240-5	tr	1-1	2+
B4963-1	1-1	1-1	2	Ia5823-1	3-2	1-1	1+
" -5	1-3	1-1	2	Ia5840-3	3-1	3-3	3+
B4969-3	1-1	2-1	3	Ia5843-3	2-1	2-2	2+
B4970-2	1-1	0-0	2	Ia5848-1	2-1	1-1	3
" -4	2-1	1-1	2+	Ia5852-1	3-1	3-2	2+
" -5	2-1	1-1	2+	Ia5869-1R	0-0	1-1	2+
" -6	3-1	1-1	2+	Ia5885-6	3-1	3-2	2
" -7	1-1	2-1	2+	Ia58159-1	0-0	0-0	2+
" -12	2-1	1-1	2+	Ia58164-2	3-1	4-2	3
B4973-3	1-1	2-1	3	" -7	2-1	2-1	3
B4976-2	1-1	1-1	2+	Ia58234-1	2-1	2-2	2+
B4977-1	3-1	2-1	2+	Ia58255-2	1-1	2-1	--
" -2	3-2	3-1	2+	Ia58274-2	2-1	2-1	2
B4981-4	1-1	1-1	2+	" -3	3-2	4-4	2+
" -5	0-0	1-1	2	Ia58277-1	2-1	3-2	2+
B4983-3	2-1	2-1	3+	CS11888	tr	1-1	2+
B4992-3	1-1	0-0	3	CS11889	1-1	1-1	3
B5002-4	3-1	2-1	3+	CS11918	0-0	1-1	2
B5011-10	3-1	3-1	3	CS13153	tr	0-0	3
B5018-1R	0-0	0-0	2+	CS13222	2-1	0-0	2
B5025-1	0-0	2-1	2+	CS13925	tr	2-1	2+
B5028-7	2-1	2-1	3	CS13928	0-0	0-0	2+
B5031-8	2-1	1-1	2	CS13950	tr	tr	2+
" -10	0-0	1-1	1	CS13951	0-0	0-0	3
B5039-5	3-1	3-2	2	M-20	1-1	1-1	3
B5094-1	3-2	2-1	2	Minn. P-40	1-1	1-1	3
B5159-2	0-0	0-0	2	TL6894	2-1	1-1	3
Cl50-7	1-1	1-1	1+	TL6937	tr	tr	1+
Cl61-1	1-1	tr	2+	Blanca	0-0	tr	2+
Cl63-7	0-0	1-1	2+	Bounty	3-1	2-1	2+
" -8	--	tr	2+	Canso	1-1	1-1	2+
" -45	2-1	3-1	3	Catoosa	0-0	tr	3
Cl77-12	tr	4-2	3+	Delus	4-1	3-1	3
Cl82-14	tr	1-1	2+	Early Ohio	2-1	2-1	2
Cl85-3	1-1	tr	3	Excel	3-1	2-1	2
Cl91-3	3-1	0-0	3+	Huron	tr	1-1	2+
G223-2	4-2	3-1	3	Kennebec	2-1	1-1	3
G224-7	2-1	1-1	1+	Kesewick	0-0	3-1	2
G228-2	3-1	3-2	2	Merrimack	1-1	1-1	2+

continued

Greeley table 1, continued.

Pedigree	Fe Cl <sub>3</sub>			Pedigree	Fe Cl <sub>3</sub>		
	1st Rep.	2nd Rep.	Test*		1st Rep.	2nd Rep.	Test*
Navajo	tr	--	2	Saco	1-1	1-1	--
Norland	1-2	1-2	3	Snowflake	2-1	3-1	--
Redskin	0-0	0-0	3	Tawa	tr	1-1	--
Russet Burbank	0-0	0-0	--				
Russet Rural	2-1	0-0	--				

1/ Type pustules: 1=small, superficial, 2=large, superficial, 3=large, rough pustules, 4=large pustules, shallow holes, 5=large pustules, deep holes.

\* Ferric chloride tests conducted by Dr. L. A. Schaal. Readings: 0 No color, completely susceptible; 1 Very little green color--slight resistance; 2 Light green, medium resistance; 3 Dark green, medium to high resistance; 4 Very dark green, high resistance.

Greeley table 2. Results of tests with various insecticides for control of the green peach aphid; the comparative field and greenhouse leafroll readings of tubers from those treated plants.

Insecticide	Rate/A (Actual)	Total Aphids 1961	Percent Control 1961	Leafroll Plants - 1962		
				Field	Greenhouse	Total
Dimethoate	1/2#	86	97.9	23	22	45
Thiodan	1/2#	182	95.4	22	31	53
Phorate*	2#	2,950	26.7	27	21	48
Phorate	2#	4,069	--	18	10	28
Guthion	1/2#	11,745	--	15	20	35
Check		4,024		28	27	55

\*Received midseason application--2#.

Greeley table 3. Results of spray trials for control of the green peach aphid.

Material	Rate/A (Actual)	Total Apterous-Alate	Control Pct.
Thiodan 50% W. P.	1/2#	3-2	99.1
Systox, 2#/gal., E. C.	1/6#	6-1	98.7
Dimethoate, 4#/gal.	1/4#	34-0	93.7
Phosphamidon, 4#/gal.	1/2#	94-1	82.4
Di-Syston, 10% gran.	2 1/2#	259-7	44.3
Check		541-1	



Greeley table 4. Yields of four varieties with different seed size and spacing.

Early Gem	Total	No. 1's	Per acre		B size	Rots
			Throwouts	Oversize		
0.1 lb. cut wide spacing	102	47	31	18	5	1
0.2 lb. cut wide spacing	162	84	46	21	10	1
0.2 lb. whole wide spacing	214	15	53	34	10	2
0.1 lb. cut narrow spacing	178	98	41	29	7	3
0.2 lb. cut narrow spacing	213	112	66	18	12	5
0.2 lb. whole narrow spacing	277	151	72	32	18	4
Kennebec						
0.1 lb. cut wide spacing	155	62	61	19	12	1
0.2 lb. cut wide spacing	209	99	69	26	12	3
0.2 lb. whole wide spacing	251	125	81	29	12	4
0.1 lb. cut narrow spacing	176	83	57	20	10	6
0.2 lb. cut narrow spacing	225	110	68	21	20	6
0.2 lb. whole narrow spacing	245	138	66	22	18	1
Haig						
0.1 lb. cut wide spacing	117	76	15	22	4	0
0.2 lb. cut wide spacing	142	91	20	23	8	0
0.2 lb. whole wide spacing	254	163	22	51	16	2
0.1 lb. cut narrow spacing	120	70	14	30	6	0
0.2 lb. cut narrow spacing	163	105	18	29	10	1
0.2 lb. whole narrow spacing	306	206	34	39	27	0
Norland						
0.1 lb. cut wide spacing	86	57	5	18	6	0
0.2 lb. cut wide spacing	96	65	8	16	7	0
0.2 lb. whole wide spacing	145	99	10	25	10	1
0.1 lb. cut narrow spacing	108	82	7	9	9	1
0.2 lb. cut narrow spacing	107	78	7	12	10	0
0.2 lb. whole narrow spacing	120	91	7	8	13	1

Greeley table 5. Total yields in a maximum performance test of the varieties Norland and Early Gem for 1962.

Variety	Treatment	Yield per acre	Difference per acre
		Cwt.	Cwt.
Norland	Irrigated once per week	165	
	Irrigated twice per week	347	182 (increase)
Early Gem	Irrigated once per week	208	
	Irrigated twice per week	353	145 (increase)

continued

Greeley table 5, continued.

Norland	No tractor wheel in rows	263	
	Tractor wheel rows	250	13 (decrease)
Early Gem	No tractor wheel in rows	289	
	Tractor wheel rows	272	17 (decrease)

Greeley table 6. Results of different planting dates on specific gravity, percentage of reducing sugars content and chip color of 5 potato varieties for 1962.

Variety	<u>Specific Gravity</u> <u>Planting Dates</u>			
	<u>April 27</u>	<u>May 18</u>	<u>June 15</u>	<u>Mean</u>
Blanca	1.078 <sup>1/</sup>	1.080	1.086	1.081
Early Gem	1.058	1.061	1.062	1.060
Katahdin	1.075	1.074	1.080	1.076
Norland	1.061	1.066	1.062	1.063
R. Rurals	1.081	1.081	1.082	1.081
Mean	1.071	1.073	1.074	1.072

<u>Percentage of Reducing Sugars</u>				
Blanca	.197	.187	.264	.216
Early Gem	.278	.259	.343	.293
Katahdin	.191	.215	.232	.213
Norland	.270	.217	.187	.225
R. Rurals	.220	.203	.221	.215
Mean	.231	.216	.249	.232

<u>Chip Color</u>				
Blanca	36.73	38.73	34.37	36.61
Early Gem	23.37	29.30	24.67	25.78
Katahdin	35.37	36.13	35.87	35.79
Norland	24.87	28.77	31.90	28.51
R. Rurals	35.35	35.10	35.23	35.23
Mean	31.14	33.61	32.41	32.38

<sup>1/</sup> Each data is the mean of three replications.

<sup>2/</sup> A color reading of 30 or more represents a saleable potato chip.

Greeley table 7. Yields of 5 potato varieties planted on 3 different dates.

Variety	Total	No. l's	Yield per acre-cwt		B size	Rots
			Throw- outs	Over- size		
<u>Early Planting (April 27)</u>						
Blanca	274	147	40	10	76	1
Early Gem	98	29	51	3	14	1
Katahdin	272	98	67	49	57	1
Norland	No sample - yield very low					
R. Rural	156	72	34	34	16	0
<u>Medium Planting (May 18)</u>						
Blanca	163	75	34	15	39	0
Early Gem	85	20	27	19	18	1
Katahdin	190	103	31	21	31	4
Norland	35	No sample - yield very low				
R. Rural	30	No sample - yield very low				
<u>Late Planting (June 15)</u>						
Blanca	266	142	64	9	50	1
Early Gem	245	91	97	52	2	3
Katahdin	242	126	29	59	28	0
Norland	298	203	18	21	54	2
R. Rural	206	110	37	20	39	0

Greeley table 8. Yields of 5 potato varieties harvested on 3 different dates.

Variety	Total	No. l's	Yield per acre-cwt		B size	Rots
			Throw- outs	Over- size		
<u>Early Harvest (Sept. 3)</u>						
Blanca	136	68	23	10	35	0
Early Gem	66	17	38	0	11	0
Katahdin	126	59	23	13	28	3
Norland	46	19	15	0	12	0
R. Rural	32	9	10	1	11	1
<u>Medium Harvest (Sept. 20)</u>						
Blanca	175	86	47	0	42	0
Early Gem	140	33	92	2	12	1
Katahdin	184	98	37	14	30	5
Norland	69	21	20	15	13	0
R. Rural	62	20	22	9	9	2
<u>Late Harvest (Oct. 10)</u>						
Blanca	211	108	50	23	28	2
Early Gem	129	23	81	17	8	0
Katahdin	217	122	31	31	33	0
Norland	114	55	15	21	23	0
R. Rural	81	35	24	7	15	0



ALASKA  
C. H. Dearborn  
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Notes on Preliminary Testing of Advanced Generations

Potato clones that had shown resistance to field frosting of tops in late stages of growth were evaluated under field conditions for frost resistance at 5 physiological stages of growth. Emergence that determined stage of growth for frost resistant clone Code 27-11 was June 18, 27, July 9, 19 and 30. For Kennebec emergence was June 15, 25, July 9, 12 and 30. Other clones emerged approximately on these dates. Tuberization had not occurred on some frost resistant clones when frosted September 5. Air temperature was 28° F. in the adjacent Official Weather Bureau shelter which is generally 3 to 4 degrees warmer than air temperature at potato top level.

Frost resistance in resistant clones was the same, irrespective of date of emergence. Frost injury was apparent first at the junction of petiole and lamina of apical shoots. Potato leaves were frozen stiff and broke under pressure instead of bending. Frost resistant leaves became slightly flaccid on thawing in bright sunshine but regained their turgor by 10:30 A. M., September 5. Non-resistant leaves lost their capacity to retain cell sap following thawing.

Data for single plots of advanced generation clones from other states are presented. Marketable potatoes were those over 2 inches in diameter. The reader should note that yields are based on 4, 5, or 8 hills per variety and should be interpreted likewise. In this limited test none of the new clones exceeded Green Mountain in specific gravity. Nebraska 302-50-5 yielded as well as Green Mountain. Second growth and hollow heart were serious defects of several clones. Ona and ND4192-3 were the only ones with satisfactory specific gravity readings.

Alaska table 1. Comparative performance of new clones in Alaska with Green Mountain as a standard.

Variety	Number Hills	Marketable No.	Marketable Lb.	Under 2" No.	Under 2" Lb.	Defects No.	Defects Lb.	Specific Gravity
Ona	8	31	8.3	23	2.8	-	-	1.088
Norland	4	39	11.2	16	2.0	Shatter		1.083
B3604-1 <sup>1/</sup>	8	23	6.5	16	2.0	Cracks	3.0 <sup>2</sup>	1.071
ND 3815-1R	4	12	3.5	7	0.7	4	2.0 <sup>3</sup>	-
ND 4192-3	4	19	6.7	19	2.7	-	-	1.087
ND 4524-7R	4	23	6.4	24	2.6	6	2.5 <sup>3</sup>	1.076
Neb 156-51-2 <sup>1</sup>	8	33	10.0	28	3.1	9	4.5 <sup>4</sup>	1.081
Neb 302-50-5	8	47	20.3	9	1.0	-	-	1.073
Neb 315-48-3x	8	29	13.4	28	4.6	2	7.3 <sup>2</sup>	1.072
Green Mountain	8	55	21.8	20	2.4	-	-	1.093
Red Pontiac	4	28	10.5	14	1.3	4	3.4 <sup>2</sup>	1.079
PI 188625	5	14	2.6	43	2.5	-	-	-
PI 188635	5	38	9.5	93	6.7	-	-	1.064
PI 188656	4	-	-	25	2.8	2	0.5 <sup>4</sup>	-

<sup>1/</sup> Hollow. <sup>2/</sup> Second growth. <sup>3/</sup> Growth cracks. <sup>4/</sup> Stolon-end constriction.



ARIZONA

N. F. Oebker and P. M. Bessey

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Fourteen potato varieties were evaluated and compared in replicated plots in Arizona in 1962. Also 29 varieties in single rows were observed.

The test plots were located on two farms near Queen Creek in Maricopa County. The planting on the LeBaron Farm was made February 2, and the trial on the Hawes Farm was planted February 27.

Each variety plot consisted of 30 seed pieces spaced 7 inches apart at LeBaron's and 6 inches at Hawes'. The rows were 34 inches apart. Selected varieties were replicated five times at each location. A single row consisted of only 30 hills; these plots for observation were planted only at LeBaron's. All plots were fertilized and watered adequately.

The LeBaron planting was harvested June 5, and the Hawes' potatoes were dug June 18. Even though there were some differences in maturity, only one harvest was made at each location. The potatoes were graded and stored for later chipping tests. Yield and specific gravity of each variety are listed in Arizona tables 1, 2, and 3. The percent of marketable potatoes making U.S. No. 1's is also shown. The culls indicate the yield of unmarketable or defective potatoes per acre.

Results of chipping tests are shown in Arizona tables 4 and 5. Each variety was chipped two weeks and six weeks after harvest. For the first 2 weeks, the potatoes were held at 78° F., then at 43° F. for 2 weeks and back at 78° F. the last 2 weeks.

The varieties which looked especially good in these trials were ND 3815-1R and LaRouge for the fresh market and Merrimack, Kennebec, Golden Chipper and LaChipper for chipping. Others showing promise were Snowflake, Navajo and Superior.

Selection ND 3815-1R, a red variety, produced yields equal to Red Pontiac and Red LaSoda and had much better color and appearance than these 2 commercial varieties. LaRouge, a red, oblong potato, yielded well in observation plots and had good market appearance. Bounty, Redskin and Catoosa did not compare with the above red varieties because of poorer color or shape.

For chipping, Merrimack, Kennebec, and Golden Chipper continue to stand out, although in the Hawes planting, Merrimack yielded much less than the other two varieties. This difference in yield was probably in part due to condition of seed potatoes; the Merrimack seed for the Hawes planting arrived late and appeared much more dormant than the other varieties at planting time. A serious problem with Kennebec and Golden Chipper was the number of tubers with second growth and growth cracks. Merrimack had the highest specific gravity and produced the most chips per 100 pounds of peeled potatoes.

Snowflake and Navajo gave satisfactory yields of both fresh potatoes and desirable chips. Navajo had very smooth, white tubers. In the observational plots LaChipper looked outstanding; it had a high yield of smooth, white potatoes with a high specific gravity. Superior looked like a variety worth watching because of its good appearance, high specific gravity and freedom from defects.

One russet, A 175-7, produced a good yield of marketable potatoes while other russets in the trial had many misshapened tubers. A 175-7 has round to oblong tubers with shallow eyes. ND 3740-11 is worthy of further consideration but had problems with growth cracks and small size.

In studying seed potatoes for fall production, observations were made on sprouting of spring dug potatoes after about 12 weeks in storage. (See Arizona table 6). The red and early varieties, especially ND 3815-1R produced sprouts more readily than the later white varieties.

Arizona table 1. Yield and specific gravity of potato varieties in replicated tests at LeBaron Farm, 1962.

Variety	Seed Source (State)	U.S. No. 1 Yield per acre		Culls per acre	Specific gravity
		Cwt.	Pct.		
ND 3815-1R	N.D.	242a	95	10	1.078 de
Merrimack	Me.	237a	92	22	1.091a
F 29-1	N.D.	230ab	92	23	1.072 fg
Red LaSoda	N.D.	229ab	92	27	1.072 fg
Snowflake	N.D.	219ab	92	25	1.084 bc
Golden Chipper	-	217 ab	97	58	1.084 bc
Kennebec	N.D.	204abc	94	86	1.081 cd
Red Pontiac	N.D.	203abc	87	14	1.067 g
Navajo	Colo.	200abc	86	15	1.085 bc
Plymouth	Me.	187 bcd	93	20	1.078 de
Ona	Me.	170 cd	84	16	1.075 ef
Pungo	Me.	162 cd	86	10	1.087a
B 3725-1	Me.	160 d	92	51	1.082 bcd

Arizona table 2. Yield and specific gravity of potato varieties in replicated test at Hawes Farm. 1962.

Variety	Seed Source (State)	U.S. No. 1 Yield per acre		Culls per acre	Specific gravity
		Cwt.	Pct.		
Kennebec	N.D.	383a	92	32	1.083ab
Red LaSoda	N.D.	381a	92	28	1.079 cd
Golden Chipper	-	365a	94	22	1.083ab
ND 3815-1R	N.D.	356a	97	14	1.080 bc
Red Pontiac	N.D.	353a	89	17	1.072 e
Snowflake	N.D.	256b	88	16	1.084ab
Navajo	Colo.	255b	85	15	1.083ab
F 29-1	N.D.	224 bc	87	37	1.075 de
Merrimack*	Mich.	220 bc	83	8	1.085a
Ona	Me.	182 c	77	15	1.075 de

\*Immature at harvest (more dormant than others at planting).

Arizona table 3. Yield and specific gravity of potato varieties in single rows (not replicated) at LeBaron Farm, 1962.

Variety	Seed Source (State)	U.S. No. 1 Yield per acre Cwt.	Culls per acre Cwt.	Specific gravity
<u>Red</u>				
LaRouge	Wis.	288	22	1.080
Bounty	Colo.	246	33	1.081
Redskin	Colo.	237	17	1.083
Catoosa	La.	220	14	1.079
TL 6894	La.	152	11	1.072
Erlired	N.D.	138	35	1.085
Excel	Colo.	91	24	1.088
Minn. P-40	Colo.	89	22	1.076
<u>Russet</u>				
A 175-7	Id.	226	23	1.085
ND 3740-11	N.D.	193	50	1.075
Russet Rural	Colo.	91	40	1.087
A 170-9	Id.	84	99	1.079
<u>White</u>				
LaChipper	Wis.	334	46	1.088
B 3602-4	Colo.	260	9	1.081
Superior	Wis.	249	10	1.089
Irish Cobbler	Wis.	218	70	1.089
Merrimack	Colo.	215	33	1.092
Tawa	Colo.	203	28	1.080
Saco	Colo.	190	17	1.079
T 461-1	N.D.	189	5	1.086
Saco	Id.	180	23	1.085
T 461-1	Minn.	168	12	1.077
Delus	Colo.	157	35	1.091
TL 6937	La.	156	26	1.087
Osage	N.D.	150	54	1.089
Blanca	Colo.	142	26	1.088
C.S. 11889	Colo.	129	12	1.077
C.S. 13928	Colo.	122	36	1.090
Canso	Colo.	114	15	1.085



Arizona table 4. Yield and color of chips from potato varieties in replicated test at LeBaron Farm, 1962.

<u>Variety</u>	<u>Chip yield 1/</u>		<u>Chip color 2/</u>	
	After weeks in storage <u>Two</u>	<u>Six</u>	After weeks in storage <u>Two</u>	<u>Six</u>
Merrimack	35.1	44.2	4.4	4.0
Snowflake	35.1	40.6	5.0	4.7
Golden Chipper	33.5	39.8	5.2	4.8
Kennebec	32.4	40.8	5.4	5.3
Pungo	33.7	39.2	4.6	4.4
Navajo	32.4	39.6	4.7	4.8
ND 3815-1R	32.0	39.9	5.1	4.6
Ona	31.3	40.5	5.5	4.9
Plymouth	32.4	37.6	4.5	5.0
B 3725-1	32.3	37.6	5.3	5.9
F 29-1	31.7	36.8	5.6	5.6
Red Pontiac	30.9	37.0	6.3	5.7
Red LaSoda	29.3	38.2	6.1	5.8

1/ Pounds of fried chips per 100 pounds of peeled fresh potatoes.

2/ Rating (1 - light; 10 - dark) with the desirable range being 3 to 7.

Arizona table 5. Yield and color of chips from potato varieties in replicated test at Hawes Farm, 1962.

<u>Variety</u>	<u>Chip yield 1/</u>		<u>Chip color 2/</u>	
	After weeks in storage <u>Two</u>	<u>Six</u>	After weeks in storage <u>Two</u>	<u>Six</u>
Merrimack	33.8	41.0	6.2	6.1
Snowflake	33.8	39.3	5.8	6.7
Navajo	33.7	38.5	5.4	5.5
ND 3815-1R	33.8	38.1	6.1	6.4
Kennebec	31.5	39.8	5.8	6.6
Red LaSoda	31.6	38.6	6.4	8.7
Golden Chipper	31.3	37.7	6.2	7.1
Ona	31.9	35.6	5.7	6.3
F 29-1	30.2	37.0	6.4	8.1
Red Pontiac	30.8	36.0	6.4	8.4

1/ Pounds of fried chips per 100 pounds of peeled fresh potatoes.

2/ Rating (1 - light; 10 - dark) with the desirable range being 3 to 7.

Arizona table 6. The number of sprouts appearing on potatoes in storage (3 weeks at 78° and 9 weeks at 48°), 85 days after 1962 harvest.

Potatoes from LeBaron Farm		Potatoes from Hawes Farm	
Variety	Sprouts per Tuber	Variety	Sprouts per Tuber
ND 3815-1R	6.0a	ND 3815-1R	4.0a
Red Pontiac	3.2 b	Red Pontiac	1.6 b
Pungo	2.8 b	Red LaSoda	1.4 b
Red LaSoda	2.6 b	Golden Chipper	1.2 bc
Plymouth	2.5 bc	Navajo	1.1 bc
Navajo	1.7 cd	Kennebec	1.1 bc
Ona	1.5 de	Snowflake	1.0 bc
Snowflake	1.4 de	Ona	1.0 bc
Kennebec	1.4 de	Merrimack	1.0 bc
F 29-1	1.1 de	F 29-1	0.7 c
Merrimack	0.9 de		
Golden Chipper	0.9 de		
B 3725-1	0.7 e		

CALIFORNIA  
Glen N. Davis  
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In 1962 potatoes were grown at Shafter, Hollister and Davis. The planting at Shafter included 12 named varieties in a replicated yield test. The number of replications because of seed supply was not uniform (3 to 5); hence the data were not analyzed statistically. Results are presented in table 1. No variety included, equalled, or exceeded the yield of White Rose, the check variety. However, 9 of the varieties produced tubers having a higher average specific gravity than those of White Rose. The variety, Superior, was highest with a specific gravity of 1.097 but it ranked 8th in yield.

Forty-three advance generation seedlings were planted in 25-hill lots to test for yield and quality. One seedling, our number 48-17 (from a cross of Merrimack x Al80-26) produced a higher yield than the White Rose check and had a specific gravity of 1.090. Fourteen additional lines performed well enough to be retained for additional testing.

Approximately 8000 first-generation seedlings, representing 44 different parental combinations, were grown in 1962. From these 21 selections were made for continued testing. Ten of the 21 had the variety Merrimack for one of the parents. Two of the best looking seedlings came from the cross of White Rose x Redskin.

The plot at Hollister was planted with 3 named varieties and 22 numbered experimental lines. There were one to four replications depending on the seed supply. The numbered lines had previously been selected for resistance to Verticillium wilt at Presque Isle, Maine, by the USDA.

Data from the Hollister plot are presented in table 2. The relative resistance to Verticillium wilt is based on the length of time the tops remain green. This is, of course, affected somewhat by the period of natural maturity of the different lines. It was probably further affected in 1962 by a light infestation of late blight following an unseasonal rain in early October. The tops on 2 lines, B4878-4 and B4878-14 were still green and vigorous when the plot was harvested 145 days after planting.

At Davis in the Spring of 1962, crosses were made representing 30 different parental combinations. The seed from the crosses were planted in July and resulting seedling tubers harvested the last of November. These will go into the field in the spring of 1963. In addition the tubers of approximately 40 lines, previously field tested, were increased for further testing in 1963.



California table 1. Potato variety test, Shafter, California, 1962.

Kind	Yield in pounds Mean	Specific gravity	No. Rep.
White Rose	52	1.085	5
Kennebec	49	1.091	5
Pontiac	44	1.081	5
Superior	35	1.097	4
Canadian Russet	26	1.093	5
Onaway	41	1.088	4
Redbake	47	1.090	3
Rushmore	34	1.092	4
Norgleam	41	1.093	3
Rukat	28	1.083	5
Golden Chipper	44	1.092	5
Merrimack	30	1.090	5

25 hills per replication

Total Shafter plot including above - 43 seedlings in advance test (25 hills each) and first generation seedlings approximately 2 acres.

Fertilizer - 600 lbs. per acre of 16-20-0.

California table 2. Potato variety test, Hollister, California, 1962.

Kind	Yield in pounds Mean <u>1/</u>	Specific gravity	Days after planting tops dead	No. Rep.
Canadian Russet	25	1.081	132	2
Blanca	32	1.075	124	3
LaSoda	37	1.076	124	2
B4744-1	38	1.090	132	2
B4751-2	24	1.082	132	1
B4751-5	24	1.065	124	1
B4774-8	28	1.073	145	1
B4774-17	33	1.079	145	2
B4774-20	19	1.074	132	1
B4783-1	23	1.082	124	2
B4828-11	26	1.081	145	1
B4829-3	39	1.082	132	1
B4832-6	30	1.070	124	4
B4841-17	38	1.074	132	2
X792-94	33	1.084	124	1
B4853-15	27	1.083	132	2
B4860-5	40	1.079	124	2
B4878-4	51	1.082	145*	1
B4878-7	46	1.081	132	2
B4878-14	29	1.082	145*	2
B1590-2	37	1.085	132	2
B1590-7	26	1.081	124	2
B3817-17	29	1.076	132	2
V21-43	41	1.076	145	2
X792-94	35	1.080	132	1

\* Tops still green at harvest.

1/ Average for 25 hills.

Size of plot - 1/10 acre.

Fertilizer - 10-10-10 at 600 lbs. per acre.

CANADA (Ontario)  
G. R. Johnston and R. G. Rowberry  
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Ontario Regional Potato Variety Trials, 1962

The data of these trials are summarized in tables 1-11. A short discussion of the main characteristics of each entry in the 1962 Regional Variety Trials follows:

Irish Cobbler. Standard early variety. Earliest vine maturity of any entry in the trial. Sizes its tubers relatively early. Vigorous vines. Nearly always produces a good, if not perfect, stand. Tubers are blocky, irregular and deep-eyed. The set is good. Sometimes oversize is a problem. With oversize, hollow heart may be prevalent. Subject to most tuber diseases, especially common scab. A fairly good yielder of marketable size tubers. About average in total solids content (a high of 22.3 and a low of 17.5). Stores very well at 40° F. Fair to very good boiler and baker. Some after-cooking darkening encountered at a few locations. Fair to good chipper from 53° storage. Didn't condition well for chipping from 40° storage. Tubers not of desirable shape for french frying. French fry scores better from 40° storage when conditioned for 2 weeks before frying. Cobbler is a dependable variety. Its greatest value in Ontario is when harvested as an "early" in the July-August period.

Kennebec. Standard in the medium-late class and the standard for chipping and french frying quality. Vines mature medium-late. Tubers size almost as early as Cobbler. It is sometimes harvested as a "second early." Very vigorous plants but the stands are sometimes "spotty." Tubers are round to oblong, generally smooth unless oversized, and shallow-eyed. It is a light setter and oversize is often a problem unless the vines are killed mechanically or chemically. Kennebec is susceptible to scab and silver scurf. There was 10% of tuber late blight at Ft. William. The tubers green very readily in light. Kennebec again outyielded all other entries in the trials. However, at several of the locations, if the oversize tubers had not been taken into account, the yields (of 2½ inches and over) would have been considerably lower. Average in total solids content--low of 18.0 and high of 22.3%. A fair to good boiler and baker. Many tubers greened due to exposure to light. Not exceeded by any other entry as a chipper or french frier from 53° storage. Conditioned the best from 40° storage for chipping but not for french frying. In Ontario, as a chipper and french frier, Kennebec is the best of the presently-licensed varieties. Kennebec, however, has 4 main shortcomings: (1) tendency to oversize (2) "greens" very readily if exposed to light even for a "short" period of time (3) only fair storage quality at 53° F., and (4) very susceptible to verticillium wilt.

Sebago. The standard, late-maturing, table stock variety in Ontario. Vines mature very late and the tubers are late in sizing. Very vigorous plants. Stands are usually good. Roundish, smooth tubers with shallow eyes and bright skin. Stolons tend to adhere. The set is heavy. Tubers are field resistant to late blight but only fairly resistant to common scab. Second only to Kennebec in yields of tubers 2½ inches and over, but not so much oversizing. Stores well at 40° F. but not too well at 53° F. Below the regional average in total solids. Good to very good boiler. Fair to good baker. Resists after-cooking darkening. Not quite as good as Kennebec as a chipper and french frier. Main disadvantages are: (1) lateness of vine maturing and tuber sizing (2) adhering stolons (3) a little lower in solids than is desirable.



F4724. 3rd year regionally. Mid-season vine maturity. Tubers do not size quite as early as Kennebec. Plants not quite as vigorous as Cobbler but gets off to an early start in the spring. Round to oblong tubers with shallow eyes. Skin varies from smooth to slightly flaked and is light tan in color. Tubers tend to become large due to a relatively small set but are smooth and hollow heart is not common. Some growth cracks at a few locations. Resistant to the common race of late blight. Susceptible to black rot and early blight. Very resistant to scab. Yields with Cobbler. Stores very well at 40°. Similar in 1962 to Cobbler and Kennebec in total solids. Good to excellent as a boiler and baker--superior to the standards, Cobbler, Kennebec and Sebago. Only fair chipping scores at most locations. Good to excellent french fry scores from 53° storage at only 5 of the 11 locations in 1962. From 40° storage followed by 2 weeks at 70°, F4724 produced satisfactory french fry scores at only 4 locations. At Fort William, F4724 had outstanding french fry scores. F4724 was also tested in Grower Evaluation trial in 1962 (see next section of report). Based on the data from the Ontario regional trials, it is doubtful if F4724 can be recommended for release without a further year of trial, especially on growers' farms and subsequent trial processing at commercial concerns (e.g. chipped, french fried, flaked, etc.).

FG2213-175. 3rd year. Mid-season vine maturity. Tubers size with Kennebec. Weak to strong vigor. Roundish, flattened tubers with fairly shallow eyes. Good set of fairly uniform, bright tubers. Stolons longer than normal--"sunburning" of exposed tubers. Susceptible to late blight, scab and silver scurf. Growth cracks at some locations. Equal to Sebago in yielding ability but the lowest solids content of the entries in the trial. Stores well at 40°. Poor to fairly good boiling and baking quality in 1962. Poor to fair chipping and french fry prospect at most locations. Discard.

F5356. 1st year. Vines mature with Kennebec but tubers do not size as early. Upright growth habit. Vigorous as Cobbler. Tubers are round to oblong with shallow eyes and roughened, thick, brown skin. Shape is often irregular with a tendency to "pointers" at some locations. Some stations reported other defects such as "cracking-type" scab, growth cracks and second growth as sprouts or knobs. Susceptible to scab and tuber late blight (50% at Ft. William). Not as high yielding as Kennebec or Sebago. Higher solids content than the standards. Poor to very good boiling and baking ratings. At some locations stem-end, after-cooking darkening was severe. Equal to Kennebec as a chipper from both 53° and 40° (plus conditioning). Almost equal to Kennebec as a french frier. Because of its good frying ratings should be retested regionally in 1963.

Arenac. 2nd year. On the average the vines mature slightly earlier than Kennebec but the tubers size later. As vigorous as Cobbler. Tubers are roundish, uniform, shallow-eyed, bright, but could have sized better at some locations. Occasional harvest cracks and hollow heart reported. Moderately scab-resistant. Ten percent tuber late blight at Ft. William. Immune to virus X. Very susceptible to leaf roll. Yields with Cobbler and tuber size is smaller than Kennebec--the set is heavier. Second highest total solids (21.3% regional average) in the trials. Good to excellent boiling and baking scores--highest baking scores (89% average). Equal to Kennebec as a chipper from 53° storage but doesn't condition as well in two weeks following 40°. Equal to Kennebec as a french frier from both storage temperatures. Arenac had a promising performance in trials on organic soil at Bradford Marsh. Should be re-tested for a 3rd year regionally and placed in grower evaluation trials for commercial processing in 1963 (if seed is available).



I8140-1. 1st year. Vines mature earlier than Kennebec. Plants medium to strong in vigor. Blocky tubers with pink, slightly netted skin, and pink, medium-deep eyes. Good set but didn't size well in locations where the weather was drier than normal. A few locations reported hollow heart, growth cracks and occasional pearl-shape. Resists common scab, tuber late blight and leaf roll. Lower yielding than Cobbler. Equal to Kennebec in solids. Equal to Sebago in boiling quality but superior to the three standards in baking. Equal to Kennebec as a chipper from 53° storage but didn't condition as well from 40°. As a french frier, equal to Kennebec from 53° but superior from 40° plus conditioning. However, I8140-1 is not of desirable shape for cutting for french fries. Low yielding ability plus Cobbler-like shape along with the pink skin color may limit the acceptance of this seedling by the trade. Recommend discard from the 1963 regional trial.

F5247. 1st year. Medium-late vine maturity. Tubers size later than those of Kennebec. Vigorous as Cobbler. Very poor stand at Bradford location. Tubers are round to oval, with shallow eyes and smooth to slightly netted skin. Tuber shape is sometimes irregular with knobs and sprout tubers prevalent at drought locations. Some locations reported harvest cracks and cracking-type scab. Susceptible to common scab and tuber late blight (10% at Ft. William). Equal to Sebago in yield. Higher than the 3 standards in solids content. Fair to excellent boiler and baker depending on location. Some after-cooking darkening reported. Only chipped well from 53° storage at 3 locations; only conditioned well for chips from 40° storage at one location (Ridgetown). Very good to excellent french fry scores at a few locations; fair to poor at others. F5247 may merit a second year in regional trial.

Blanca. 2nd year. Vines mature medium-late to late. Tubers late in sizing. Plants are medium-strong in vigor and spreading in habit. Heavy set of roundish, flattened, uniform tubers with shallow eyes and flaky, tan-colored skin. Didn't size well where soil moisture supply was limiting. Susceptible to harvest cracking. Resistant to scab and moderately resistant to tuber late blight. Average yield of Blanca for the region was relatively low. Solids higher than Sebago and Cobbler; equal to Kennebec. Good to excellent boiling and baking scores at most locations. After-cooking sloughing often a problem when boiled. Not generally suitable at most locations for chipping--too dark color. French fry ratings vary from poor to excellent depending on location. It is doubtful if Blanca merits further trial in the regional variety tests; perhaps in grower evaluation trial in specific areas.

F5325. 1st year. Vines mature as late as Sebago. Tubers size late. Almost as vigorous as Kennebec. Spreading habit of growth. Tubers are generally roundish to oval but often irregular in shape. Skin is smooth to slightly netted with pink eyes and pink blotches around the eyes. Eye depth is medium. Second growth as sprouts, sprout-tubers and knobs was reported from many locations. Susceptible to common scab but resistant to tuber late blight. Stolons adhere. Heavy set of tubers but yield of tubers 2½ inches and over was not equal to the three standards--Cobbler, Kennebec and Sebago. Highest average total solids of any entry in the trial. Fair to good boiler. Fair to excellent baker. Cooks slightly yellowish and sometimes shows stem-end darkening. As a chipper, is equal to Kennebec from 53° storage but didn't condition as well for chips from 40°. French fry scores not impressive from most locations. Generally too late in maturity for Northern Ontario. Discard.

Ontario table 1. Ontario regional potato trials, 1962. Summary of vine maturity ratings.

Variety	Vine maturity at locations											Mean
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	
Irish Cobbler	2	2	2	2	2	2	2	2	2	2	2	2.0
F4724	2	2	3	4	3	4	2½	2	3	3	3	2.9
FG 2213-175	2	1	4	4	4	4	3	3	3	3	3	3.1
Kennebec	4	3½	4	4	3	4	4	4	4	4	3½	3.8
F5356	4	3½	4	4	4	4	4	2	4	4	5	3.9
Arenac	3	2	4	4	4	4	4	4½	4	2	3½	3.5
I 8140-1	3	2	2	4	3	4	3	4½	3	3	4	3.2
F5247	3	2	3	4	4	4	4	4	3	3	3	3.4
Blanca	3	3	5	4	4	4	3	4	3	4	3	3.6
F5325	4	5	3	5	5	5	5	2½	5	5	5	4.5
Sebago	4	4	5	5	4	5	5	4½	5	4	5	4.6
Mean	3.1	2.7	3.5	4.0	3.6	4.0	3.5	3.4	3.5	3.4	3.6	

Ontario table 2. Ontario regional potato trials, 1962. Summary of plant vigor ratings.

Variety	Plant vigor at locations											Mean
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	
Irish Cobbler	3	3	5	4	4	4	2½	4	4	3	3	3.6
F4724	2	4	2	4	4	4	3½	3	4	3	4	3.4
FG 2213-175	2	3	3	4	2	4	3	3	4	3	4	3.2
Kennebec	3½	5	5	5	5	5	4½	5	5	4	4	4.6
F5356	4	3	4	4	3	4	3	4	5	3	4	3.7
Arenac	3	3	4	4	3	4	3	4	4	4	2	3.5
I 8140-1	3	3	4	3	4	3	3½	4½	4	3	4	3.5
F5247	3	4	4	4	3	4	3	3	4	3	3	3.5
Blanca	3	4	4	5	3	5	3	3	3	4	2	3.5
F5325	3	5	3	5	5	5	5	3	5	4	4	4.3
Sebago	3½	4	4	5	4	5	4	5	5	4	4	4.3
Mean	3.0	3.7	3.8	4.6	3.6	4.6	3.5	3.7	4.6	3.5	3.5	

Ha--Harrow; Ri--Ridgetown; Si--Simcoe; OAC--Guelph; Du--Dufferin Co.; Br--Bradford (Muck Res. Sta.); Sm--Smithfield; Ott--C.E.F., Ottawa; Wa--Walford (Algoma); Co--Cochrane; FW--Fort William.

Ontario table 3. Ontario regional potato trials, 1962. Summary of total solids.

Variety	Total solids contents in per cent by locations											Means
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	
Irish Cobbler	18.0	20.0	20.0	19.8	20.5	17.5	22.3	17.5	21.0	19.8	19.8	19.7
F4724	16.8	19.3	19.8	19.9	21.8	19.2	21.5	17.5	22.3	20.0	19.5	19.8
FG2213-175	16.5	20.3	20.8	18.2	19.0	17.0	19.3	17.8	19.0	17.3	17.0	18.4
Kennebec	18.0	20.8	21.3	19.8	20.8	18.0	22.3	19.0	20.8	21.5	18.8	20.1
F5356	19.3	19.3	21.4	21.3	21.4	19.9	23.5	19.8	22.3	20.0	20.0	20.7
Arenac	18.3	19.9	23.8	21.5	22.3	20.5	21.5	20.8	23.0	22.2	20.8	21.3

continued



Ontario table 3, continued.

I8140-1	18.3	20.5	20.0	21.3	20.5	19.0	23.3	19.0	21.4	18.8	20.5	20.2
F5247	20.0	21.8	22.6	20.3	20.5	18.2	22.5	19.3	22.5	21.4	20.8	20.9
Blanca	17.5	19.5	21.5	20.5	22.3	18.5	21.4	18.0	20.3	20.5	19.8	20.0
F5325	19.0	18.5	21.3	22.5	21.8	19.0	23.8	20.3	23.0	24.1	22.3	21.4
Sebago	16.8	16.5	21.0	19.0	19.5	17.8	21.0	17.5	19.9	19.3	17.3	18.7
Means	18.0	19.7	21.2	20.4	20.9	18.6	22.0	18.8	21.4	20.4	19.7	20.1

Ontario table 4. Ontario regional potato trials, 1962. Summary of yields of 2½ inches and over.

Variety	Yields of tubers 2½ inches and over in Cwt/A											Means
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	
Irish Cobbler	142	158	187	346	217	104	334	362	90	192	260	217
F 4724	72	56	117	388	247	207	330	366	144	203	340	225
FG2213-175	103	142	183	389	233	172	368	343	107	278	451	252
Kennebec	200	150	229	489	265	266	447	581	182	260	299	306
F5356	135	83	212	359	247	209	416	279	186	220	321	242
Arenac	93	98	176	377	218	218	367	218	118	153	253	208
I8140-1	84	84	76	294	226	172	273	235	95	255	332	193
F5247	145	135	188	426	262	186	443	356	148	257	308	259
Blanca	65	63	140	361	183	220	309	252	108	179	229	192
F5325	57	40	118	302	248	144	449	213	150	218	329	206
Sebago	142	97	190	449	223	217	437	328	175	255	351	260
Means	113	101	156	380	234	192	379	321	136	225	316	233

Ontario table 5. Ontario regional potato trials, 1962. Summary of culinary ratings--boiled.

Variety	Culinary ratings - boiled - by locations											Means
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	Fw	
Irish Cobbler	80	89	83	77	85	89	85	84	73	81	82	83
F4724	81	94	92	87	88	92	91	88	85	87	87	88
FG2213-175	66	82	93	76	78	74	83	74	72	74	83	79
Kennebec	76	80	87	84	81	76	85	84	72	89	81	81
F5356	81	87	77	83	78	69	83	87	72	67	77	87
Arenac	81	86	91	88	80	87	91	90	80	98	83	86
I 8140-1	80	84	86	84	83	85	88	88	71	88	85	86
F5247	87	78	84	90	79	85	86	83	71	83	79	82
Blanca	76	94	86	90	90	86	93	87	83	96	85	88
F5325	84	79	81	85	80	78	74	68	82	83	82	80
Sebago	80	79	91	88	84	82	88	86	82	89	83	85
Means	79	85	86	85	82	82	86	85	77	84	80	83

Ontario table 6. Ontario regional potato trials, 1962. Summary of culinary ratings--baked.

Variety	Culinary ratings - baked - by locations											Means
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	
Irish Cobbler	85	85	79	83	89	75	86	75	80	88	89	83
F4724	71	76	84	92	91	87	94	75	93	91	95	86
FG2213-175	58	62	83	71	74	88	78	63	71	64	78	72
Kennebec	76	73	87	89	86	75	90	73	81	91	85	82
F5356	88	75	87	89	85	81	81	81	81	81	82	83
Arenac	78	78	87	97	93	92	92	85	91	97	92	89
I 8140-1	88	75	73	95	90	85	94	80	88	82	92	86

continued



Ontario table 6, continued

	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	Means
F5247	87	70	83	84	77	84	93	77	83	91	89	83
Blanca	74	71	80	90	95	88	94	78	90	94	92	86
F5325	81	71	64	89	80	80	84	66	83	92	88	80
Gebago	74	66	85	86	86	85	88	74	89	90	78	82
Means	78	72	81	88	86	84	88	75	85	87	87	83

Ontario table 7. Ontario regional potato trials, 1962. Summary of culinary ratings--chipped following 53° F. storage of tubers.

Variety	Chip ratings following 53° F. storage of tubers--						By locations					
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	Means
Irish Cobbler	80**	85	75	75	80	75	80	70	75	75	80	77
F4724	75	85	85	75	75	70	75	70	70	70	70	75
FG2213-175	70	85	75	70	75	80	75	65	70	80	70	74
Kennebec	85	85	90	80	85	80	80	80	75	70	80	81
F5356	85	90	85	85	80	75	85	80	85	70	70	81
Arenac	80	80	80	80	85	70	90	75	85	80	75	80
F8140-1	85	85	85	85	75	75	85	80	80	80	75	81
F5247	80	90	85	75	75	70	80	80	70	75	70	77
Blanca	80	90	80	80	75	70	75	70	80	65	80	77
F5325	90	90	85	85	80	70	80	75	--*	80	75	81
Gebago	85	90	85	80	80	70	80	75	80	80	75	80
Means	81	87	83	79	79	73	81	75	77	75	75	79

Ontario table 8. Ontario regional potato trials, 1962. Summary of culinary ratings--chipped following 40° F. storage and conditioned 2 weeks at 70° F.

Variety	Chip ratings following 40° F. storage and conditioned 2 weeks at 70°F.											
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	Means
Irish Cobbler	70**	70	75	70	80	75	70	70	80	75	70	73
F4724	70	70	70	70	75	65	70	70	70	65	65	69
FG2213-175	80	85	75	75	70	65	65	65	65	65	65	71
Kennebec	80	85	85	85	85	70	80	75	90	70	75	80
F5356	80	90	80	85	85	70	85	80	80	65	80	80
Arenac	70	85	70	70	80	75	80	70	80	70	80	76
F8140-1	80	85	85	70	80	80	65	65	80	65	70	75
F5247	75	90	75	70	70	65	70	75	70	70	70	73
Blanca	70	70	75	75	65	65	65	65	70	65	65	68
F5325	80	85	85	80	75	70	75	70	--*	70	70	76
Gebago	85	85	80	75	80	80	70	70	80	65	80	77
Means	76	82	78	75	77	71	72	71	77	68	72	74

\* Tuber sample not received at the Smithfield Lab.

\*\* Maximum rating is 90.

Ontario table 9. Ontario regional potato trials, 1962. Summary of culinary ratings--french fried following 53° F. storage of tubers.

Variety	French fry ratings following 53° F. storage--by locations											
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	Means
Irish Cobbler	75	85	75	75	75	95	75	70	75	75	85	78
F4724	65	80	75	80	75	75	85	55	90	70	90	76
FG2213-175	65	65	75	60	70	35	90	65	65	45	90	66
Kennebec	75	85	95	75	95	95	85	95	85	85	85	87
F5356	75	85	95	90	85	95	75	75	85	85	75	84
Arenac	75	80	95	85	85	95	85	75	95	90	85	86
I8140-1	85	85	95	90	75	95	95	75	85	80	85	86
F5247	55	80	95	85	70	65	75	90	85	90	75	79
Blanca	85	85	85	85	75	65	75	75	85	90	75	80
F5325	65	80	65	85	75	65	85	75	--*	90	70	76
Sebago	75	80	85	85	85	85	85	55	95	75	80	81
Means	72	81	85	81	79	79	83	73	84	80	81	80

Ontario table 10. Ontario regional potato trials, 1962. Summary of culinary ratings--french fried following 40° F. storage of tubers and 2 to 3 weeks conditioning at 70° F.

Variety	French fry ratings following 40° F. storage and 70° F. conditioning											
	Ha	Ri	Si	OAC	Du	Br	Sm	Ott	Wa	Co	FW	Means
Irish Cobbler	75	85	85	75	75	85	65	65	95	90	100	81**
F4724	75	75	75	65	80	35	80	65	85	50	100	71
FG2213-175	65	75	75	65	75	85	55	65	75	40	30	64
Kennebec	85	75	95	95	85	75	75	90	75	85	85	84
F5356	75	95	75	75	95	75	95	95	75	70	85	83
Arenac	85	75	95	90	75	85	90	65	95	75	85	83
I8140-1	85	85	95	85	90	95	100	75	75	75	100	87**
F5247	75	85	95	60	85	55	75	75	100	90	85	80**
Blanca	65	85	85	75	75	65	50	50	95	65	90	73
F5325	85	75	95	85	75	85	65	65	--*	75	85	79**
Sebago	75	75	95	75	75	85	75	75	75	70	95	79
Means	77	80	88	77	80	75	75	71	84	71	86	78

\*Tuber samples not received at the Smithfield Lab.

\*\*The mean french fry ratings for these varieties was improved slightly, by 40° F. storage and conditioning at 70° F. compared to 40° F. storage.

Ontario table 11. Reducing sugar content at different stages of tuber storage, and related to chip color at one stage.

Variety	Location	Reducing Sugar Content			Chip color at "C"
		at "A"	at "B"	at "C"	
Kennebec	Bradford	0 to +	++	+ to ++	70
	O. A. C.	0 to +	+ to ++	0	85
	Smithfield	0	+ to ++	0	80
F4724	Bradford	+++	++	+++	65
	O. A. C.	+	+ to ++	++	70
	Smithfield	0 to +	++ to +++	+++ to ++++	70
Arenac	Bradford	+ to ++	+ to ++	+ to ++	75
	O. A. C.	+ to ++	++	+	70
	Smithfield	0 to +	+ to ++	++	80

A = Shortly after harvest, held at 55° F. until tested.

B = Immediately after 3 weeks storage at 40° F.

C = After 3 weeks at 40° F. and 2½ weeks conditioning at 70° F.

Rating

Approximate reducing  
Sugar content (%)

0	0
+	0.10
++	0.25
+++	0.50
++++	2.00 or more



CONNECTICUT  
Arthur Hawkins<sup>1/</sup>  
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Varieties. A potato variety test was conducted by the Storrs Agricultural Experiment Station, Storrs, Connecticut, in 1962 on a commercial potato farm in the Connecticut River Valley. Seed of most of the varieties was supplied through the cooperation of the USDA National Potato-Breeding Program from Presque Isle, Maine.

Experimental procedures, total yields, yields over 1-7/8", yields over 1-7/8" with seriously off-shaped tubers removed, tuber defects, dry matter, and chip color are given in Connecticut table 1.

Yields: Irrigation was required during the dry period from mid-July to about August 10. The potato foliage was injured during July by volatile materials carried by the wind from road oil which had been applied on a road parallel to the test rows.

Mohawk produced the highest marketable yield followed by Kennebec, Chippewa, Pungo, and Green Mountain produced about the same yield, followed by 47156 and Katahdin.

Dry Matter. Arenac had the highest dry matter content followed by Mohawk, Pungo, Green Mountain, and Kennebec.

Chip Color. The potatoes were stored at 50° until the first week of January at which time the storage temperature was raised to 65° for three weeks before chipping. Kennebec, Katahdin and Plymouth produced the lightest colored chips followed by Chippewa, Arenac, 47156 and Ona.

Small Lots of Seedlings. Twenty seedlings which were found to be promising in 1961 were planted in 8-hill lots at the above location and at another location. In addition, 50 other seedlings were planted in 5-hill lots at the above location. Several of the seedlings produced good yields of tubers favorable in shape and dry matter content.

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<sup>1/</sup> Agronomist, Plant Science Department, University of Connecticut, Storrs, Conn.

Connecticut table 1. Yield<sup>1/</sup> and specific gravity of potato varieties and seedlings, S. Windsor, Connecticut, 1962<sup>2/</sup>

Variety or 3/ seedling (Spacing 9" except *)	Total yield per acre	Yield per acre, over 1 7/8"					
		Free of serious off shape 4/				Dry 5/ Matter	Chip 6/ Color
		Pct.	Cwt.	Pct.	Cwt.		
Arenac (10")*	246	85.2	210	85.2	210	21.6	6.0
Blanca (10")*	235	80.6	189	80.6	189	20.2	7.2
Chippewa	320	93.1	298	93.1	298	18.6	5.4
Gr. Mountain	314	90.3	283	90.3	283	20.7	7.6
Katahdin	293	94.4	277	94.4	277	19.5	5.2
Keeweenaw	289	89.4	259	89.0	257	17.6	8.5
Kennebec (8")*	351	95.6	336	94.8	333	20.5	5.1
Mohawk	403	97.7	393	96.9	390	20.8	7.3
Ona	298	85.7	256	85.7	256	19.0	6.4
Plymouth	261	91.7	239	91.7	239	20.0	5.2
Pungo	314	94.2	296	93.3	293	20.7	7.9
47156	299	93.8	280	92.9	278	20.0	6.1
L.S.D.					64.0		

- 1/ Plots: 1 row 21 feet long. Replication: 4 in randomized blocks (3 sections x 4 rows) except 3 replications of 47156. Soil: Enfield silt loam; previously in tobacco 4 years. Fertilizer: 2100 lbs. 6-8-8-2 in sidebands.
- 2/ Season and conditions: S. Windsor, 7 miles N. E. of Hartford. Planted: April 18 except Keeweenaw planted 5/16/62. Dry from mid-July to mid-August; irrigation applied. Cool July and August. Injury to foliage from road tar application on hot day.
- 3/ Seed from A. E. Schark, USDA, Presque Isle, Maine, except Keeweenaw from Michigan State University; Arenac and Blanca B-size seed spaced 10", other seed cut to 1 1/2 to 2 oz. spaced as indicated.
- 4/ Tuber observations: Hollow Heart 1/4" - Plymouth 2 of 20. Drought spots: Pungo, 2 severe of 20.
- 5/ Dry matter calculated from specific gravity. Specific gravity by weight in air and in water. Ave. of 4 replications (12-15 tubers 2 1/2" to 3" diam. per sample). Specific gravity 1.080 = 20.2%. Dry matter; 1.070--18.1; 1.060--16%, using Von Scheele equation.
- 6/ Harvested October 3/62. Placed in 50° storage 11/16/62, specific gravity Dec. 11. Storage temperature raised to 65° for 3 weeks prior to chipping 1/25/63. Chip color average of 2 samples each consisting of 10 tubers from first and second blocks. Proposed Color Reference Standard 1/25/54 Procter and Gamble Company. Chip with readings 6.0 and 7.0 satisfactory; higher the reading, the darker the chip.

DELAWARE  
E. P. Brasher  
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Yield and solids tests were conducted on 22 varieties and seedlings in 1962. The experimental conditions and procedure were as follows: location, Substation, Georgetown; soil, Norfolk sandy loam; plot design, randomized block; replications, four; plot size, 3 by 24 feet; spacing in row, eight inches; fertility, 2000 pounds of 10-10-10 per acre in bands at planting time; irrigation, when soil moisture dropped to 50 per cent available; fungicide, Zineb; and insecticide, DDT. The results are shown in Delaware table 1.

Delaware table 1. Yield and solids tests of varieties and seedlings, Georgetown, Delaware, 1962.

Variety or seedling	Yield per acre		U.S.No. 1	Solids
	U.S.No. 1	Total		
	Cwt.	Cwt.	Pct.	Pct.
Haig	350	372	94	14.5
B 605-10	347	360	96	16.0
Pungo	345	358	96	15.7
Onaway	320	339	94	14.5
Cobbler	316	335	94	16.0
La 91-78	310	348	89	14.5
B 3563-2	307	322	95	17.2
Delus	283	287	99	16.9
Redskin	283	311	91	13.5
Kennebec	281	306	92	13.5
Nordak	268	279	96	14.3
Allehanna	261	277	94	12.1
Norgleam	261	270	97	15.2
Earlaine	260	296	88	12.3
Teton	254	267	95	13.8
I 1171-8	228	258	88	16.2
B 4093-18	225	230	98	12.8
B 3602-4	210	230	91	12.3
Navajo	201	232	87	16.2
Katahdin	195	217	90	12.8
B 3726-6	185	271	68	17.2
B 3556-12	118	195	61	16.9
L.S.D. 5%	62	62	--	0.7
L.S.D. 1%	81	81	--	1.2



FLORIDA (Hastings)

A. H. Eddins

Resistance of potato seedlings and varieties to corky ringspot. Twenty-five potato seedling crosses and varieties of USDA origin were grown in replicated plots of corky ringspot-infested soil to determine their reaction to the disease. The corky ringspot-susceptible varieties, Red LaSoda, Redskin, and Sebago were used as checks.

The potatoes were irrigated by the water furrow method but the upper 2 to 3 inches of soil remained dry during most of the growing season due to subnormal rainfall which probably prevented development of corky ringspot except in tubers growing in low-lying areas where soil moisture was more favorable for tuber infection than in higher ground.

Results of the 1962 tests are summarized in Florida table 1. Few tubers were affected with corky ringspot in susceptible varieties. Tuber infection amounted to only 1.5 percent in Sebago, 4.4 percent in Red LaSoda and 4.8 percent in Redskin. Low percentages of affected tubers also were found in B 3391-2, B 4084-8, B 4860-5, Norland and Teton which were tested for the first time in 1962. B 313-2 and B 606-3 escaped infection, as previous tests have shown that they are susceptible to the disease.

Merrimack, Plymouth, Pungo, Saco, TL 1859 and B 3725-1 which are known to be highly resistant to corky ringspot showed no symptoms of tuber infection in 1962. None of the tubers of the new entries, B 4160-1, B 4812-6, B 4812-16, B 4818-1, B 4828-4, B 4846-9, TL 2988, Haig and Hunter were affected with corky ringspot, but they may have escaped infection owing to mildness of the disease in 1962.

Florida table 1. Reaction of USDA potato seedling crosses and varieties to corky ringspot when grown in infected soil in 1962.\*

Variety or Selection	Number	Tubers				
		Percent Infection By Number		Pounds	Percent Infection By Weight	
		Average	Range		Average	Range
B 313-21	252	None	None	45.4	None	None
B 606-3	333	None	None	72.4	None	None
B 3391-2	301	5.3	0-19.4	60.1	5.3	0-19.0
B 3725-1	232	None	None	44.0	None	None
B 4084-8	229	0.9	0-4.2	53.1	1.3	0-6.7
B 4160-1	330	None	None	70.2	None	None
B 4812-6	301	None	None	50.0	None	None
B 4812-16	239	None	None	39.8	None	None
B 4818-11	325	None	None	66.7	None	None
B 4828-4	275	None	None	74.4	None	None

continued

Florida table 1, continued.

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B 4846-9	199	None	None	34.5	None	None
B 4860-5	209	4.3	0-11.4	41.8	6.2	0-16.9
TL 1859	260	None	None	78.7	None	None
TL 2988	306	None	None	84.8	None	None
Haig	328	None	None	60.6	None	None
Hunter	230	None	None	43.4	None	None
Merrimack	265	None	None	46.0	None	None
Norland	305	0.3	0-2.3	71.3	0.7	0-5.2
Plymouth	287	None	None	84.6	None	None
Pungo	294	None	None	83.6	None	None
Red LaSoda	298	4.4	0-16.7	81.6	4.8	0-17.4
Redskin	354	4.8	0-15.6	94.9	5.5	0-21.8
Saco	212	None	None	45.7	None	None
Sebago	272	1.5	0-10.5	77.7	1.7	0-12.1
Teton	258	0.8	0-2.4	60.1	1.0	0-3.2

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\* Potatoes planted 12-29-61 in 10-hill plots replicated 7 times. Tubers dug and examined for corky ringspot symptoms May 4, 1962.

Potato Variety and Seedling Selection Trials in 1962  
E. N. McCubbin and A. H. Eddins  
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Replicated Variety Yield Trials. Twenty-four potato varieties and 29 seedling selections were grown and compared in three replicated yield trials at the Potato Investigations Laboratory at Hastings, Florida in 1962. Seed stocks were obtained mostly from the USDA and Canadian Potato Breeding Programs at Presque Isle, Maine, Beltsville, Maryland, Baton Rouge, Louisiana and Charlettetown P.E.I., Canada. Seed of a few stocks were secured from Wise Potato Chip Company, Berwick, Pennsylvania and Ben Picha, Grand Forks, North Dakota.

Experimental: Location, Hastings, Florida; soil, recently-cleared and leveled Ona fine sand; plot size, single rows 12 feet long and 40 inches apart; seed size, 1.5- to 2-ounces; seed spacing, 12 inches; plot design, randomized blocks; replications, five, each trial; planting date, January 17, 1962; fertilizer, 2400 pounds of 6-8-8 per acre in bands; fungicide, Maneb; insecticide, endrin; harvest date, May 15, 1962--116 days after planting.

The growing season was a very good one, except for deficient rainfall. This was supplemented by irrigation water run into water furrows on both sides of the 16-row bed of new land devoted to the three variety trials. There were no frosts of any consequence to potato plants after they appeared above ground. A period of temperatures of 36° to 30°F. with strong winds in the first 2 weeks of March caused some injury to the potato plants. Yields were approximately 2/3 of those produced in the trial in 1961.

Results of the three trials are presented in Florida tables 2, 3 and 4. Seedlings B 962-9 and TL 1859 significantly outyielded Sebago, the standard variety at Hastings. Tubers of these seedlings, however, were unattractive, those of one being rather rough and those of the other being pink in color. Four white varieties, Ona, Teton, Avon and Allehanna, a white seedling, TL 7627 and 5 red varieties, Redskin, Red LaSoda, Catoosa, Dazoc and Bounty outyielded Sebago but differences were not significant. Sebago significantly outyielded 9 other varieties and 17 other seedlings.



Florida table 2. Yields of 9 potato varieties and 7 seedling selections grown in replicated trial at Hastings, Florida in 1962. Planted 1/17/62<sup>1/</sup>

Variety or Selection	Yields in 100-Pound sacks per acre							
	US1A Total	Good US1A	Util. US1A	US1B Total	Good US1B	Util. US1B	Total US1A & 1B	Marketable US1A & 1B
14. B 962-9	204.0	92.0	56.4	6.7	17.4	1.7	210.8	153.1
3. TL 1859	198.4	124.0	48.4	12.1	14.1	0.9	210.6	179.6
15. Ona	183.9	113.5	31.0	15.7	20.4	1.1	199.6	152.9
7. Teton	178.7	115.2	43.3	16.8	12.6	3.0	195.8	171.7
10. Avon	185.6	123.0	48.0	8.4	16.2	1.3	194.0	177.3
16. Sebago	170.3	112.0	37.3	12.3	22.2	2.6	182.6	158.7
9. TL 6937	151.8	75.4	45.0	23.9	14.7	6.5	175.7	139.5
13. B 3391-2	156.1	120.4	23.1	17.2	18.6	2.8	173.2	158.1
8. B 606-3	150.5	94.8	39.8	17.7	12.9	2.2	168.2	146.9
11. Fundy	151.0	76.5	44.1	14.7	13.6	3.4	165.8	131.1
2. B 3725-1	141.5	110.0	26.5	15.5	13.8	2.6	157.0	150.1
6. Saco	140.9	82.7	38.5	11.9	11.3	2.6	152.9	129.0
1. B 313-21	130.3	66.6	44.8	20.5	11.4	8.4	150.8	127.9
5. Pungo	141.7	89.8	28.7	8.6	10.8	0.9	150.3	123.4
12. Haig	109.6	94.5	7.3	24.1	17.1	0.0	133.7	119.7
4. Plymouth	103.8	82.9	14.9	22.4	12.1	2.4	126.2	116.3
L.S.D. 19:1	24.0	28.6	15.9	6.8	4.9	3.4	20.9	29.2
99:1	31.9	38.0	21.1	9.0	6.6	4.5	27.8	38.9

<sup>1/</sup> Based on yields from 13-foot, single-row plots replicated 5 times; seedpieces planted 1 foot apart in rows 40 inches apart. Dug May 15, 1962--116 days after planting.

Table 3. Yields of 8 red potato varieties, 3 red seedling selections and Sebago grown in replicated trial at Hastings, Florida in 1962. Planted 1/17/62<sup>1/</sup>

Variety or Selection	Yields in 100-Pound Sacks per acre							
	US1A Total	Good US1A	Util. US1A	US1B Total	Good US1B	Util. US1B	Total US1A & 1B	Marketable US1A & 1B
21. Redskin	207.2	131.1	48.2	18.5	9.9	5.4	225.7	194.5
23. Red LaSoda	215.1	154.2	44.1	5.4	3.9	1.1	220.5	203.3
17. Dazoc	199.0	136.8	42.6	18.3	7.8	7.3	217.3	194.5
20. Catoosa	200.5	147.1	34.3	10.5	4.9	4.1	211.0	190.4
19. Bounty	197.3	151.4	35.1	9.5	4.1	3.0	206.8	193.6
27a Sebago	188.0	134.8	28.4	16.1	7.5	3.7	204.0	174.4
24. TL 6894	157.9	122.5	15.7	11.0	6.2	1.9	168.9	147.9
18. Norland	158.7	130.9	21.8	9.9	8.4	0.9	168.6	162.0
25. Red Pontiac	149.9	90.9	43.7	9.1	5.4	2.6	159.1	142.6
27. TL 6896	90.2	74.1	14.2	2.4	1.3	1.1	92.6	90.7
22. Redburt	72.4	50.2	15.1	4.1	2.4	0.6	76.5	68.3
26. T 177-3	43.7	28.9	9.3	1.9	-	1.5	45.6	39.8
L.S.D. 19:1	31.2	26.0	16.7	4.6	3.9	2.9	30.2	28.1
99:1	41.6	34.8	22.2	6.1	5.1	3.9	40.3	37.5

<sup>1/</sup> Based on yields from 13-foot, single-row plots replicated 5 times; seedpieces planted 1 foot apart in rows 40 inches apart. Dug May 15, 1962--116 days after planting.

Florida table 4. Yields of 7 potato varieties and 19 seedling selections grown in replicated trial at Hastings, Florida in 1962. Planted 1/17/62<sup>1/</sup>

Variety or Selection	Yields in 100-Pound sacks per acre							
	Total US1A	Good US1A	Util. US1A	Total US1B	Good US1B	Util. US1B	Total US1A & 1B	Marketable US1A & 1B
46. TL 7627	232.2	163.3	38.1	10.8	8.0	0.9	243.1	210.4
49. Allehanna	236.9	108.5	71.3	5.4	1.9	0.0	242.3	181.6
53. Sebago	204.6	144.9	25.0	11.6	7.5	1.5	216.2	178.8
48. Kennebec	199.2	132.5	34.7	15.3	7.3	3.4	214.5	178.7
45. TL 6543	192.3	135.9	37.9	21.7	14.9	2.4	213.9	191.2
50. Gold Chip	202.0	119.9	50.6	9.0	5.0	2.4	211.0	177.9
36. B 3837-1	179.8	107.0	40.3	21.1	13.1	2.6	200.9	163.0
37. 4084-7	189.9	110.5	42.0	7.8	4.9	0.0	197.7	157.4
33. B 3677-1	187.4	146.5	24.3	8.8	3.9	2.8	196.2	177.5
28. B 3692-4	180.7	88.3	31.4	11.8	5.4	1.7	192.5	126.8
51. Snowflake	181.1	148.4	22.6	10.3	6.9	1.9	191.4	179.8
30. B 2858-5	171.2	101.6	37.0	15.1	8.8	2.2	186.3	149.5
31. B 605-10	176.6	98.4	51.0	8.0	4.1	0.7	184.6	154.2
43. F 4834	168.4	100.8	37.7	10.8	5.8	1.9	179.2	146.2
32. Ia 1111-8	165.0	114.8	31.2	13.1	7.3	2.1	178.1	155.3
38. B 3429-22	155.9	107.7	36.2	15.7	10.3	2.2	171.6	156.4
52. Superior	154.2	115.6	22.8	12.5	9.3	1.7	166.7	149.3
34. B 721-1	158.7	110.5	38.3	7.3	6.0	0.7	166.0	155.5
44. F 29-1	150.5	97.8	36.2	11.4	4.9	2.2	161.9	141.1
47. Norgleam	148.0	94.1	25.9	13.3	6.2	2.1	161.3	128.3
29. B 2187-25	148.4	110.0	30.8	11.0	6.2	2.6	159.4	149.5
35. B 3599-8	146.4	85.1	31.4	6.2	4.3	0.0	152.5	120.8
39. X 792-94	109.4	72.8	23.5	20.0	14.9	2.8	129.4	114.1
41. 4-SL-2	68.7	39.4	20.7	7.8	3.0	2.1	76.5	65.0
40. 5-LZ-5	54.9	33.2	14.6	3.0	2.1	0.6	57.9	50.4
42. 4- V-30	45.6	31.9	9.5	6.0	3.2	1.7	51.5	46.3
L.S.D. 19:1	31.0	25.2	18.2	5.7	4.5	2.5	30.0	30.0
99:1	41.0	33.3	24.0	7.6	6.0	3.4	39.7	39.7

<sup>1/</sup> Based on yields from 13-foot, single-row plots replicated 5 times; seedpieces planted 1 foot apart in rows 40 inches apart. Dug May 15, 1962--116 days after planting.

GEORGIA  
J. E. Bailey  
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In 1962, cooperative potato yield trials with the United States Department of Agriculture were conducted in the mountain area of Georgia. The yields in hundredweight per acre and specific gravity ratings are presented in Georgia table 1.

The average yields were lower this year due to five to six weeks of very dry weather following planting in March. Late irrigation was of some value. The plot was harvested July 16.

The Allehanna and Teton varieties performed well and are very acceptable to us. Kennebec is consistently one of our best varieties from year to year. Russet Sebago and Bounty ran very high in the production of small tubers.

Georgia table 1. Potato variety test, Blairsville, Georgia, 1962.

Variety	Yield per acre		Specific Gravity
	No. 1	No. 2	
	Cwt.	Cwt.	
Allehanna	159	8	1.055
B 3725-1	65	10	1.060
B 2905-1	108	18	1.058
Norgleam	74	10	1.068
Sequoia	88	7	1.066
B 2858-5	88	14	1.068
Catoosa	114	9	1.061
Superior	106	12	1.066
Russet Sebago	87	18	1.058
Ona	86	15	1.051
Teton	153	16	1.070
Kennebec	125	12	1.066
Arenac	142	16	1.066
Earlaine	95	23	1.059
Antigo	93	9	1.056
Bounty	107	25	1.057
Katahdin	111	15	1.062
Emmet	46	19	1.071



HAITI (Kenscoff)

E. T. Bullard

From 2 to 3 tubers of 25 potato varieties obtained from R. V. Akeley, Potato Investigations, Beltsville, Maryland, were grown at an elevation of 5000 feet at Kenscoff. A summary of the results is presented in Haiti table 1.

The highest yields were produced by Ona and Ontario and the latter had the better-sized tubers. Kennebec, Merrimack, and Red LaSoda were also high yielders with good-sized tubers. Katahdin, Cayuga, and Cherokee produced medium to high yields but only Cherokee had good-sized tubers.

Variety failures probably due to susceptibility to late blight include Chippewa, Green Mountain, Irish Cobbler, Pawnee, and Teton.

Haiti table 1. Comparative yielding ability and late blight resistance of 25 American varieties grown at Kenscoff, Haiti, 1962.

Variety	Average weight per plant	Average No. tubers per plant	Average weight per tuber	Late blight Resistance <sup>1/</sup>
	Lb.	No.	Lb.	
Ontario	2.25	8.5	.13	3
Ona	2.17	13.3	.05	5
Kennebec	1.80	8.5	.11	5
Merrimack	1.80	7.5	.12	5
Red LaSoda	1.60	6.5	.12	3
Cayuga	1.20	6.0	.07	4
Katahdin	1.20	6.5	.09	3
Cherokee	1.07	4.0	.13	4
Sequoia	0.90	5.0	.09	2
Earlaine	0.90	4.0	.11	1
Houma	0.85	4.5	.09	1
Red Pontiac	0.85	5.5	.08	2
Huron	0.75	5.5	.07	2
Potomac	0.70	4.0	.18	1
Warba	0.67	4.0	.06	1
Menominee	0.67	3.5	.09	2
White Rose	0.65	4.0	.08	1
Triumph	0.50	4.5	.06	2
Kasota	0.40	3.5	.06	1
Erie	0.25	2.0	.06	2
Teton	0.20	3.5	.03	1
Irish Cobbler	0.20	5.0	.04	1
Chippewa	0.10	6.0	.02	1
Pawnee	0.01	1.0	.01	1
Green Mountain <sup>2/</sup>	0.00	0.0	.00	1

<sup>1/</sup> Late blight rating: 1 = highly susceptible; 2 = susceptible; 3 = moderately resistant; 4 = resistant; 5 = highly resistant.

<sup>2/</sup> Plants were killed by late blight.

HAWAII  
J. C. Gilbert  
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Potato Variety Trial

The selections were planted March 15 on the Island of Maui. All varieties suffered complete defoliation from Early Blight. The date of harvest gives some measure of resistance to this disease, as the plants were harvested at the time defoliation became complete. The varieties harvested last showed no sporulating lesions at the time the most susceptible variety was completely defoliated. Leaves showing pin-point lesions taken from the apparently resistant plants at this time sporulated one day after placement in a moist chamber.

None of the varieties tested produced as evenly large-sized tubers as the check-Kennebec. Adequate irrigation could not be given because of drought restrictions. Varieties marked with an asterisk should be tested here again after the new irrigation hook-up is completed, as they may produce larger tubers under better growing conditions.

Hawaii table 1. Potato variety trial, Haleakala Experiment Farm, 1962.

Variety	Date of Harvest	No. of Plants	Yield per Plant		Tuber Size
			Grams	Pounds	
* Kennebec	6/7	6	573	1.3	Mostly large
B 3813-2	5/19	4	573	1.3	Small
B 3812-27	6/12	4	820	1.8	Mostly large
* 3879-3	6/7	4	792	1.7	Mostly small
B 3956-6	6/10	4	398	0.9	Small
B 3970-1	6/14	4	660	1.4	Mostly large
B 3982-7	6/3	4	760	1.6	Mostly small
B 3956-5	6/9	4	505	1.1	Mostly small
Ac 26063	6/12	2	888	1.9	Mostly small
Ac 26088	6/25	2	1080	2.4	Mostly small
Ac 26103	6/25	2	1162	2.6	Mostly small

IDAHO (Aberdeen)

W. M. Iritani

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The potato variety evaluation trial is carried on in conjunction with the USDA breeding program at Aberdeen. The trial in 1962 was conducted in 3 locations, Aberdeen, Parma (located in western Idaho where summer temperatures average 7° F. higher than at Aberdeen), and the Egin Bench area where verticillium wilt (early dying) is a major problem. Fourteen varieties were tested at Aberdeen, 12 at Parma and 6 on the Egin Bench. The field at Aberdeen had alfalfa the previous year. At Parma and the Egin Bench they were cropped to grain. The plots at Aberdeen and Parma were 1 row wide, 25 feet long and replicated 7 times. On the Egin Bench they were 18 feet long, replicated 5 times. The seed piece was spaced 10 inches apart and row spacing was 3 feet.

Planting dates were April 24, at Parma, May 8 at Aberdeen and May 23 at the Egin Bench. Harvesting was conducted on August 26, September 26 and October 6 at Parma, Egin Bench, and Aberdeen, respectively.

The potatoes were graded for U. S. No. 1's, small, 10 ounce and oversize and rough tubers which included all knobby, dumbbell and pointed end tubers. Specific gravity range was determined by the use of brine solutions ranging from 1.075 to 1.095 at increments of 0.005. Approximately 60 pounds of U. S. No. 1's tubers from Aberdeen and Parma were thus separated. (A narrow range is desirable from the processing standpoint). After a short period of storage, reducing sugars were determined for the Aberdeen varieties.

Results: The yields on all of the trials were quite high in comparison to past years. The summer was relatively cool and fairly ideal for the production of potatoes. At Aberdeen (Idaho table 1) 2 seedlings from the breeding program A503-42 and A175-7 had the highest total and No. 1 yields. Blanca produced the largest amount of undersize tubers with Russet Burbank next. Russet Burbank was also the second high producer of rough tubers next to seedling A466-2. In the production of large tubers (10 ounces and oversize), Kennebec and seedling A503-42 surpassed the other varieties by a considerable margin.

Early dying readings give some indication of the susceptibility of varieties to verticillium wilt. However, in some cases the readings are confounded with early maturity. This is probably true in the case of Snowflake and Superior which had the highest percent of vines dead on August 24 when readings were taken. Ona, Russet Sebago, and seedling A466-2 had the least percent of vines dead at this time. Analysis of reducing sugars on November 28 revealed Menominee to have the highest amount with Mohawk and seedling A466-2 next. The reducing sugars are calculated as percent on the dry weight basis.

Performance of the varieties at Parma is shown in Idaho table 2. Kennebec produced the highest total yield with Russet Burbank and Snowflake next. Blanca and Russet Rural produced the lowest yields of No. 1's. On the contrary they had very high yields of undersize tubers. As was true at Aberdeen, Russet Burbank was one of the higher producers of rough tubers.



The Egin Bench is an area of sandy soils which is sub-irrigated. Verticillium wilt resistance is quite important for profitable production of potatoes. Kennebec (Idaho table 3) produced the highest yield at this location followed by A175-7 and Menominee which are fairly resistant to verticillium wilt. Russet Rural produced a large amount of undersize tubers. Specific gravities were generally low here, the highest being 1.0830 obtained with seedling A466-2, followed by Menominee with 1.0800.

Idaho table 4 shows the specific gravity ranges for the varieties from Aberdeen and Parma. Work in the past points towards the fact that varieties have characteristic ranges. Seedling A175-7 seems to have one of the more desirable narrow ranges. This was more evident at Aberdeen than at Parma. Russet Sebago seems to have a fairly wide range. The specific gravities at Parma were all quite high with a very high percentage of some varieties appearing in the > 1.095 column. It would probably have been better to have another separation beyond 1.095.

The average specific gravities show Mohawk to have the highest at both locations. At Parma, Russet Burbank and Blanca were about equal in specific gravity to Mohawk.

Idaho table 1. Performance of varieties at Aberdeen, 1962.

Variety	Total Yield	Yield in Cwt. per acre			10 oz. over	Early dying* Readings	Reducing Sugar Pct.
		No.1's	Under-size	Rough			
Mohawk	307	281	17	9	13	16.7	1.7
Ona	286	197	72	12	28	7.5	0.5
A503-42	395	335	54	7	90	13.3	0.5
Russet Sebago	278	203	74	2	18	9.3	0.1
Plymouth	242	188	41	13	42	40.8	0.5
Snowflake	300	240	55	5	30	85.8	0.9
A175-7	358	294	45	2	61	15.8	0.9
Kennebec	317	266	37	14	93	20.0	0.8
Russet Burbank	304	195	93	16	19	19.2	0.7
Menominee	277	222	42	12	53	10.8	2.0
Blanca	222	114	106	3	--	30.8	0.7
Russet Rural	313	215	88	10	24	12.5	1.1
Superior	246	197	46	3	41	69.2	1.3
A466-2	310	231	46	25	62	7.5	1.6
L.S.D. 5%	45	45	15	9	35		
L.S.D. 1%	60	59	20	12	46		

\* Percent dead vines (readings taken August 24, 1962).

Idaho table 2. Performance of varieties at Parma, 1962.

Variety	Yield in cwt. per acre		Undersize	Rough
	Total Yield	No. 1's		
Mohawk	340	212	20	108
Ona	375	295	65	14
Navajo	314	228	64	22
Russet Sebago	359	295	58	5
Plymouth	365	297	49	19
Snowflake	418	293	79	45
A175-7	414	261	36	117
Kennebec	497	349	41	107
<u>Russet Burbank</u>	<u>418</u>	<u>228</u>	<u>64</u>	<u>125</u>
Menominee	386	281	57	48
Blanca	350	180	164	6
Russet Rural	368	170	125	72
L.S.D. 5%	50	51	23	43
L.S.D. 1%	67	68	30	57

Idaho table 3. Performance of varieties on Egin Bench, 1962.

Variety	Total Yield	Yield in cwt. per acre			Specific Gravity	Early dying* Readings
		No. 1's	Under-size	Rough		
A175-7	364	228	122	14	1.0700	21.0
Kennebec	405	321	71	12	1.0795	48.1
<u>Russet Burbank</u>	<u>279</u>	<u>155</u>	<u>117</u>	<u>7</u>	<u>1.0759</u>	<u>45.1</u>
Menominee	358	284	43	23	1.0800	1.0
Russet Rural	272	130	140	3	1.0777	19.0
A466-2	331	186	109	33	1.0830	3.0
L.S.D. 5%	77	97	57	6	0.0054	
L.S.D. 1%	105	123	-	-	0.0073	

\* Percent dead vines (read on August 23, 1962).

Idaho table 4. Specific gravity range, Aberdeen, 1962.  
Variety Trial

Variety	Percent in each class						Mean
	<1.075	1.075 1.080	1.080 1.085	1.085 1.090	1.090 1.095	>1.095	
Mohawk	0.6	1.8	7.9	23.8	46.3	19.5	1.0927
Ona	1.5	16.8	50.4	24.4	6.9	---	1.0834
A503-42	7.1	3.6	2.4	21.4	44.0	21.4	1.0892
Russet Sebago	3.4	27.3	15.9	36.4	14.8	2.3	1.0855
Plymouth	5.2	22.7	22.7	35.7	5.8	7.8	1.0833
Snowflake	20.0	45.4	26.1	8.5	--	---	1.0786
Al75-7	0.2	32.7	46.6	20.4	--	---	1.0810
Kennebec	2.3	9.3	24.8	25.6	29.1	8.7	1.0851
Russet Burbank	1.3	10.8	40.8	25.5	18.5	3.2	1.0865
Menominee	8.5	37.6	38.8	12.1	3.0	---	1.0807
Blanca	3.4	12.7	7.6	43.2	28.0	5.0	1.0861
Russet Rural	0.6	8.3	9.0	35.2	41.7	5.1	1.0876
Superior	5.9	45.6	12.4	31.4	4.7	---	1.0817
A466-2	23.0	21.8	34.6	10.9	7.0	2.6	1.0796

Specific Gravity Range, Parma, 1962

Variety	Percent in each class						Mean
	<1.075	1.075 1.080	1.080 1.085	1.085 1.090	1.090 1.095	>1.095	
Mohawk	2.0	7.9	4.0	4.0	12.9	69.3	1.0949
Ona	5.0	11.0	19.1	18.1	28.2	18.5	1.0869
Navajo	4.9	3.0	9.9	2.0	36.6	43.6	1.0922
Russet Sebago	3.7	1.8	11.9	18.4	39.3	24.8	1.0895
Plymouth	---	1.0	4.2	8.3	36.4	50.0	1.0929
Snowflake	2.4	12.3	15.2	17.2	29.5	23.3	1.0879
Al75-7	2.7	8.2	21.1	31.2	31.2	5.5	1.0862
Kennebec	1.1	2.2	9.1	9.7	53.0	24.9	1.0918
Russet Burbank	---	---	3.4	4.1	14.2	78.2	1.0948
Menominee	7.3	2.4	7.3	9.7	21.9	51.2	1.0898
Blanca	---	1.1	8.8	5.5	13.2	71.4	1.0947
Russet Rural	---	1.9	3.9	3.9	35.9	54.4	1.0943



INDIANA  
Clare I. Harris  
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Results of a 1962 variety trial conducted on sandy loam soil at Vincennes, Indiana, are presented in Indiana tables 1 and 2. The plots were irrigated, but at times the schedule was not close enough to keep up with the water needs of the plants. The 20-foot single-row plots were spaced 36 inches apart with a 12-inch seed piece spacing in the row. The potatoes were planted March 23 and of the 6 replications, 3 were harvested on July 9 and 3 on August 2.

Internal disorders were negligible in all entries.

Indiana table 1. Potato variety trial results at early harvest date, Vincennes, Indiana. Planted March 23, and harvested July 9, 1962.

Variety	Total Yield Per Acre	"A" Size	Specific <sup>1/</sup> Gravity	Chip <sup>2/</sup> Appearance	Maturity	Second Growth	Growth <sup>3/</sup> Cracks
	Cwt.	Pct.				Pct.	
RD 5	281	92	63	2	Medium	12	3
Cobbler	270	95	69	3	M-L	7	0
Onaway	259	96	61	5	M-L	5	13
RD 36	250	97	72	2	M-E	2	7
Norland	227	95	55	1	Early	0	3
RD 19	220	97	65	2	Early	0	17
156,51-2	218	92	78	2	Medium	0	2
RD 56	203	92	73	1	M-L	5	2
Haig	202	96	68	2	Early	0	0
Snowflake	188	94	63	3	M-E	0	3
RD 53	188	94	64	3	Medium	5	0
Kennebec	184	95	65	4	Late	10	23
RD 45	183	91	69	2	Late	0	7
RD 60	179	95	63	2	M-E	0	5
Pungo	174	93	69	2	Medium	0	8
Superior	168	94	62	2	Medium	0	2
Delus	166	98	70	3	Late	5	3
RD 46	157	94	69	2	M-L	2	18
Plymouth	156	94	65	3	M-E	3	12
RD 7	153	95	63	1	Early	5	30
A 175-7	149	93	56	5	Late	7	22
RD 55	118	84	68	2	M-L	5	25
L.S.D. 1%	56						
L.S.D. 5%	42						

<sup>1/</sup> Coded by multiplying the actual value by 1000 and subtracting 1000.

<sup>2/</sup> Subjective rating with 1 the most desirable and 5 the least.

<sup>3/</sup> Based three 20-tuber samples; one from each replicate.

Indiana table 2. Potato variety trial results at late harvest date, Vincennes, Indiana. Planted March 23 and harvested August 2, 1962.

Variety	Total Per Acre	Specific <sup>1/</sup> Gravity	Chip <sup>2/</sup> Appearance	Second Growth	Growth <sup>3/</sup> Cracks
	Cwt.			Pct.	
RD 5	359	60	4	0	0
Cobbler	338	65	3	5	0
A 175-7	327	54	4	7	35
Onaway	322	55	4	3	10
RD 45	311	62	4	0	6
Kennebec	306	61	3	10	28
Snowflake	286	61	2	5	7
Pungo	285	65	3	2	8
RD 36	282	68	2	3	18
RD 53	279	60	3	0	0
RD 19	276	59	4	0	10
Norland	274	54	3	0	0
RD 60	274	57	2	0	10
RD 46	269	68	2	10	12
Delus	253	72	2	15	3
156.51-2	250	76	2	0	0
RD 55	250	70	2	10	10
RD 56	240	64	2	0	0
Superior	238	62	3	2	0
Plymouth	222	62	3	0	7
Haig	221	63	2	0	0
RD 7	171	58	2	5	47
L.S.D. 1%	51				
L.S.D. 5%	38				

<sup>1/</sup> Coded by multiplying the actual value by 1000 and subtracting 1000.

<sup>2/</sup> Subjective rating with 1 the most desirable and 5 the least.

<sup>3/</sup> Based on three 20-tuber samples; one from each replicate.

IOWA

J. L. Weigle, L. E. Peterson, and J. C. Horton

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Clear Lake - The evaluation of varieties and breeding lines on peat soils was difficult this year because excessive soil moisture did not allow normal growth. Flooding occurred several times during the season and a considerable number of the plants did not survive past the first of August. Lack of soil aeration was apparent in that symptoms of black heart developed in some tubers, particularly in the variety Superior.

Muscatine - This is a sandy area with a high water table which allows comparatively inexpensive supplemental irrigation. The primary interest in this area is for the early fresh market, but chipping potatoes also appear to be a possibility. Breeding material was planted in this area for the first time in 1962.

Norland has consistently been the best varieties in this area, considering both yield and tuber appearance. However, this year the majority of the tubers of this variety were brown instead of red at harvest. This distracted considerably from the market value of this variety. A study of this type of occurrence will be made in the future. Data from the trial of varieties and advanced selection can be found in Iowa table 1.

Resistance to hopperburn - Material is furnished to Entomology for evaluation. A detailed report of their results can be found in a separate section. Crosses were made last winter between parents having a similar level of resistance with the object of finding both a higher level of resistance and greater susceptibility.

Iowa table 1. Potato variety trial, Muscatine, 1962.

Variety	Total Yield	U. S. No. 1's	Total Solids
	Per Acre	Per Acre	
	Cwt.	Cwt.	Pct.
Red Pontiac	496.7	454.2	15.3
Norland	428.3	393.6	15.3
Red LaSoda	396.1	359.4	16.8
Kennebec	392.5	361.9	17.5
ND 3815-1R	365.5	312.7	15.7
Erlired	344.3	296.1	16.8
Haig	342.2	313.7	16.7
ND 4121-25	340.7	307.0	16.5
ND 4289-15R	310.6	274.3	18.8
ND 4122-2	304.9	285.7	16.4
Superior	303.3	283.6	----
Early Ohio	269.1	210.0	17.7
Early Gem	262.9	229.2	15.2
L.S.D. 5%	70.2	68.1	
L.S.D. 1%	93.8	90.0	



Insect Resistance Studies

E. T. Hibbs, W. H. Orgell, and D. L. Dahlman

Segregating progeny (276 individuals) from two Solanum crosses obtained from Dr. J. L. Weigle, Horticulture, were grown and screened for potato leafhopper damage at Ankeny. Cuttings of 20 were made for greenhouse propagation and study. Sixty clones, previously selected for extreme hopperburn resistance or susceptibility, were grown for comparisons. Twenty-four commercial varieties in replicated planting showed little hopperburn resistance. Russett Burbank and Sequoia were least damaged. Insecticidal control applied to split plots increased Irish Cobbler yields more than 70%, but, due to natural resistance, hopperburn resistant clones gained only 1.4%. Six replications of 12 potato selections periodically sampled for leafhopper eggs indicated that certain clones were utilized more for egg laying than were others. Ratio of eggs per terminal leaflet (the preferred site) to the total number of eggs per plant are being computed. In this study plant size (leaf area) as a variable also is accounted for. The influence of various plant components upon the behavioral sequences of feeding and oviposition are being studied in order to identify those of significance to leafhopper resistance.

Relative Hopperburn and Cholinesterase Inhibition Values  
for Potato Clones Grown at Ankeny, Iowa, in 1960 and 1961

Extracts of leaves, tuber sprouts, tuber skins, stems, flowers, and fruits of potato have been found to inhibit in vitro the catalytic action of human plasma cholinesterase on the hydrolysis of acetylcholine. It is probable that this inhibition reflects the presence of steroid glycoalkaloids (such as solanine) in potato tissue. The steroid alkaloids of potato may influence the relative resistance of certain clones to insects and other predators and parasites.

Materials and Methods - Clones of tuber-bearing Solanums were grown at Ankeny, Iowa, during 1960 and 1961. Insecticides were not applied. Visual ratings of relative hopperburn intensity were scaled in the field from 1, least, to 5, greatest intensity. Foliage samples were taken from plant midstrata and stored in a deep freeze at -15° C.

Samples of frozen leaf tissue were homogenized in distilled water, centrifuged, and the supernatant filtered through paper to yield extracts. Lyophilized human plasma served as the cholinesterase source. Aliquots of extract were added to reconstituted plasma and the mixture incubated to permit inhibition. The extent of cholinesterase catalyzed hydrolysis of substrate acetylcholine was measured by an electrometric technique.

The cholinesterase inhibitor content of extracts is expressed relative to the inhibitor content of Irish Cobbler foliage standards. For example, a clone with a Relative Inhibition (R.I.) value of 2.00 contains twice the content of inhibitory substances found in the corresponding Irish Cobbler standard. However, the same Irish Cobbler standard was not used for tissues taken at all sampling dates. Only those R. I. values based on the same Irish Cobbler standards are comparable.

Clone Sampling  
Dates

July 21, 1960  
August 4, 1960  
July 6-7, 1961 )  
August 2-3, 1961)

Irish Cobbler Standard  
Sampling Dates

July 21, 1960 (R.I. = 1.00)  
August 4, 1960 (R.I. = 1.00)  
July 3, 1960 (R.I. = 1.00)

Results and Discussion

1. Certain clones and varieties contain consistently higher or lower levels of inhibitory substances than others. The following two groups of clones are ranked in descending order of cholinesterase inhibitor content: High inhibitor level group, AIS 3025-2=AIS 3025-6=AIS 5561-16=AIS 5561-12-AIS 5561-12<sup>P</sup>=AIS 5561-13>AIS 5561-8=I5561-2; low inhibitor level group, Sequoia=3RC-8=Irish Cobbler=B2067-52>AI 56321-3>>I55238-1>Plymouth=White Rose.

2. In general, commercial varieties contain low levels of inhibitory substances (Sequoia has a somewhat higher level than most commercial varieties).

3. Seasonal changes in cholinesterase inhibitor content of foliage, rather than the absolute level at any one time, may be of greater importance to interpreting leafhopper-Solanum interactions. Comparing the July 6-7 with the August 2-3 sampling dates for 1961 (Iowa table 2), it is apparent that the inhibitor content of foliage declined for I1419-5, B2067-52, AI56321-3, and Irish Cobbler; however, inhibitor content increased during the same period for clones AIS5561-16, AIS5561-12<sup>P</sup>, AIS5561-13, AIS5561-12, AIS5561-8, I5561-2, and Sequoia. On the whole, the clones with declining inhibitor level showed considerable hopperburn injury on July 19, 1961, whereas the clones with increasing inhibitor level showed less hopperburn. The clones AI56321-3 and Sequoia were exceptions to this generalization. These data do not establish a causal relationship either between inhibitor level and hopperburn intensity or between seasonal change in inhibitor level and hopperburn intensity. If both hopperburn response and inhibitor level were linked to some common primary factor, they would show a definite correlation. Testing the degree of independence of hopperburn response and cholinesterase inhibitor level is planned, as soon as a suitable index of physiological maturity is developed.

Iowa table 2. Relative hopperburn and Cholinesterase inhibition values for 51 tuber-bearing Solanum clones.

CLONES	RELATIVE HOPPERBURN		RELATIVE INHIBITION			
			1960		1961	
	1960 Aug. 3 <sup>a</sup>	1961 July 19 <sup>b</sup>	Sampling Dates		Sampling Dates	
			July 21 <sup>c</sup>	Aug. 4 <sup>d</sup>	July 6-7 <sup>e</sup>	Aug. 2-3 <sup>f</sup>
B 2067-52	4.75	5.00	0.63		0.76	0.19
B 3556-12		5.00			0.12	
B 4257-1a 10	2.80	1.38	1.43		0.24	
B 4572				4.28		
BW 670 segregates				(1.98-6.53)		
BW 671				(2.19-6.72)		
Ohio (?) 28-1				2.52		
I 1419-5		3.63		9.38	1.05	0.49

continued

Iowa table 2, continued.

	Aug. 3 <sup>a</sup>	July 19 <sup>b</sup>	July 21 <sup>c</sup>	Aug. 4 <sup>d</sup>	July 6-7 <sup>e</sup>	Aug. 2-3 <sup>f</sup>
I 5561-2	2.10	2.00	3.13	-	1.04	1.60
MI 1419-8				3.80		
AIS 3025-2				12.14		
" " -4				4.04		
" " -5				5.51		
" " -6				10.08		
" " -7				3.95		
AIS 5025-1				4.72		
AIS 5549-2				3.88		
" " -3				4.10		
" " -4				2.53		
" " -5				4.77		
" " -7				5.38		
AI 5554-1				5.93		
" " -2				4.09		
" " -3				7.52		
" " -4				4.88		
AIS 5561-5	2.60	1.88	3.58		0.69	
" " -8	1.50	1.25	1.89		1.02	1.70
" " -12	1.80	1.50		3.14	2.30	3.01
" " -12 <sup>P</sup>	1.10	1.38	4.71		1.65	3.76
" " -13	1.25	1.25	2.95		1.82	3.48
" " -16		1.13			1.76	4.16
AI 5563-1				4.70		
" " -2				2.92		
" " -3				3.73		
I 5583-3			0.27 <sup>g</sup>			
I 55184-4				0.87		
I 55238-1	3.25	5.00	0.20		0.12	0.10
AI 55326-1				4.42		
S 5612-3				1.06		
I 56319-3				1.77		
AI 56321-3		2.63			0.43	0.28
AI 56412-1				3.31		
AI 57355-2				5.61		
I 57460-1				1.91		
AI 58475-3				2.65		
AI 58476-1				2.42		
3RC-8	4.30	4.25	0.83		0.72	0.56
Irish Cobbler	4.80	4.88	1.00	1.00	0.84	0.12
Sequoia		3.38			0.35	0.79
White Rose		4.88			0.08	-
Plymouth		4.13			0.08	-

<sup>a</sup>Mean of 6 replications; <sup>b</sup>Mean of 4 replications; <sup>c</sup>One replication, mean of 3 samples; <sup>d</sup>One replication, 1 sample; <sup>e</sup>First "peak" of leafhopper oviposition, 2 replications, mean of 3 samples; <sup>f</sup>Second "peak" of leafhopper oviposition, 2 replications, mean of 3 samples; <sup>g</sup>Only two samples; <sup>P</sup>Purple tubers, clone selected at Clear Lake, Iowa.



KENTUCKY  
Dean E. Knavel

Potato Variety Trials

The plot design was the randomized block type with 3 replications. Each plot was 75 feet long. The row spacing was 32 inches with seed spacing of 12 inches within the row. An application of 12-12-12 fertilizer was applied at the rate of 2000 pounds per acre. The yield test was planted April 19 and harvested September 1. The rainfall was slightly above normal with normal temperatures for the 1962 season which was very good for potato production in Kentucky.

Kentucky table 1. Potato variety trials for yields and specific gravity, Lexington, Kentucky, 1962.

Variety	Total Yields	U.S. No. 1's	Specific Gravity (at harvest)
	Per Acre		
	Cwt.	Pct.	
Dazoc	222	90.9	1.061
Houma	321	94.5	1.070
Kennebec	299	96.4	1.064
Mohawk	225	94.9	1.073
R. Pontiac	328	95.9	1.050
Sebago	270	94.7	1.060
Allehanna	245	93.3	1.056
R. LaSoda	278	93.6	1.051
B 3309-4	296	87.5	1.052
I 8140-1	116	91.6	1.064
LaChipper	308	95.4	1.062
Redskin	298	94.6	1.065
B 2894-24	282	94.2	1.056
B 3429-22	266	93.0	1.057
B 3599-8	164	90.1	1.058
Fundy	287	93.3	1.057
Huron	294	94.1	1.069
Katahdin	236	91.0	1.060
R. Beauty	252	92.2	1.058
Rushmore	246	94.6	1.063
Teton	287	93.0	1.062
Dazoc	223	88.5	1.058
Earlaine #2	321	90.8	1.057
B 3309-8	223	93.0	1.050
LaRouge	353	93.7	1.053
B 3725-1	194	97.8	1.063
Cherokee	279	94.0	1.066
B 3352-8	262	91.8	1.060
B 3454-5	191	78.2	1.061
B 3626-13	191	85.6	1.060
Chippewa	301	95.2	1.058
L.S.D. .05	87		

LOUISIANA

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Introduction

Very good progress was made during 1962. However, the planting at Louisiana State University was severely damaged by a seven and a half inch rain which occurred when the potatoes were about half mature. The plantings at other locations were very satisfactory.

In the 1961 report it was announced that this station would release two new varieties, namely LaRouge and LaChipper. Their official descriptions were submitted for publication to The Potato Journal during the fall and will appear shortly in one of the issues. Both of these varieties have been in the Regional Trials for the past 3 years under the seedling numbers 42-45 (LaRouge) and 91-78 (LaChipper), and from yield trials both North and South, they have proved very satisfactory. The LaRouge is earlier than Red LaSoda and has a slightly brighter, velvety red skin. It sets more potatoes per hill and shows a moderate degree of resistance to scab. The LaChipper has proved to be one of the best varieties for chipping that has ever been tried in the South. From yield data obtained in many sections of the northern area, it has outyielded the Cobbler, which it resembles in many respects, and even had a higher specific gravity in many instances. It has a degree of resistance to blight.

In the work planned for 1963 more emphasis will be given to the frost resistance studies. Of the 70 selections with frost resistant germ plasm grown this year several have shown very good horticultural characters as well as frost resistance. This is presented in Louisiana table 1 of this report.

In order to obtain a more acceptable potato for chipping and baking, more effort will be placed on breeding and selection of a potato of the oblong type.

As in the past, the scab and blight studies will be pursued. In order to save time and money, all clones, particularly the whites which have a specific gravity below 1.080 will be discarded.

Another objective will be to select varieties having less variability from the standpoint of solids and yielding ability when grown in the North and in the South.

This station will continue to cooperate in the Regional Trials. This year only one seedling, 61-125, will be entered. This seedling is an early white, having satisfactory chipping ability and reasonably high solids.

First Year Selections

On January 4 and 5, 1962, approximately twenty-five thousand seedlings were harvested. Each seedling was evaluated on skin color, shape, yield and size and only 1110 were considered worthy of selection. Four tubers of each selection were stored at 60° F. until May 21 when they were planted at Rhinelander, Wisconsin.

The weather at this location was cool and wet in the spring and hot and dry during the summer. On September 12, 1962, these clones were harvested and 243 lines were considered worthy of keeping. After specific gravity determinations were made 31 were found to run less than 1.075 in gravity and were discarded. More selections were made from these families (1) 91-78 x Katahdin (2) Early Gem x 91-28 and (3) Early Gem x Katahdin. Since one of our objectives is frost resistance many lines that possessed frost resistant germ plasm were left until frost did occur. These data were reported by Melvin Rominsky of Rhinelander, Wisconsin, and are presented in Louisiana table 1. Attention is called to code number 281 and 298 for both of these clones showed frost resistance as well as good horticultural characters.

### 1961 Clones

One year ago 181 selections were saved from our 1961 seedlings and now this number has been decreased to 33 (Louisiana table 2). Of these, 15 have been saved strictly for breeding purposes. The factors that were used to determine the worth of these clones were desirable appearance, yield, disease resistance, vigor, maturity, specific gravity, chipping ability, freedom from after-cooking darkening and storage ability. After considering all these characteristics and the performance of each of our seedlings, 12-4 and 12-83 are rated our best reds and 11-27, 11-96 and 11-150 our best whites. Scab ratings in Louisiana table 2 show that four of our lines were free from scab and definite degrees of resistance were noted in many other clones. This test was conducted in the greenhouse and was considered a severe test for measuring scab resistance.

### Disease Resistance Studies

Common Scab. Resistance of seedlings to common scab (Streptomyces scabies) was determined by inoculation of a greenhouse bed with the organism. Scab ratings in Louisiana table 2 show that four of our clones were free from scab. In this test Rushmore had type four scab with 80% coverage.

Louisiana table 1. Frost plot, Rhinelander, Wisconsin.

Code	Parentage	Sept.20	Oct. 16	Plant Size	Remarks
257	M.S.S. 3-1	1/2 green	1/2 green	Small	White skin
258	M.S.S. 3-1 (x)	1/2 green	1/2 green	Small	White skin
259	M.S.S. 3-1 (x)	Dead	Dead	Medium	White
260	M.S.S. 3-1 (x)	1/2 green	1/2 green	Small	White
261	M.S.S. 3-1 (x)	Green	Dead	Small	White, smooth
262	M.S.S. 3-1 (x)	Green	Green	Small	White
263	M.S.S. 3-1 (x)	Dead	Dead	Small	Pink
264	M.S.S. 3-1 (x)	Green	Green	Small	White
265	M.S.S. 3-1 (x)	1/2 green	1/4 green	Medium	White
266	M.S.S. 3-1 (x)	Dead	Dead	Small	White
267	5.3 x Kat.	Green	Dead	Medium	White
268	5.3 x Kat.	Green	Green	Small	White
269	5.3 x Kat.	Froze	Dead	Medium	White
270	5.3 x Kat.	Green	1/4 green	Small	White
271	5.3 x Kat.	Green	Green	Small	White
272	5.3 x Kat.	Green	Green	Small	White
273	5.3 x Kat.	Green	Dead	Small	White

continued



Louisiana table 1, continued.

274	5.3 x Kat.	Green	Green	Small	White
275	5.3 x Kat.	Dead	Dead	Small	White
276	5.3 x Kat.	Green	Green	Small	White
277	02-1 (x)	Froze	Dead	Medium	Red
278	02-1 (x)	Froze	Dead	Medium	Red Pink
279	02-1 (x)	Froze	Dead	Medium	Red
280	02-1 (x)	1/2 green	Dead	Medium	Red, rough
281	02-1 (x)	1/2 green	1/4 green	Large	Red, excel.-best one
282	02-1 (x)	Froze	Dead	Medium	Red
283	02-1 (x)	Froze	Dead	Medium	Red, excel., good shape
284	02-1 (x)	Froze	Dead	Large	Red, excellent
285	02-1 (x)	Froze	Dead	Small	Pink
286	02-1 (x)	Froze	Dead	Large	Red, excellent
287	02-1 (x)	No plant	No plant	None	
288	02-1 (x)	Froze	Dead	Large	Red, excellent
289	02-1 (x)	Froze	1/4 green	Large	Pink, excellent
290	02-1 (x)	1/2 green	Dead	Small	Red
291	02-1 (x)	No plant	No plant	None	
292	02-1 (x)	No plant	No plant	None	
293	02-1 (x)	1/2 green	Dead	Medium	Red
294	02-1 (x)	Froze	Dead	Medium	Red
295	02-1 (x)	Dead	Dead	Medium	Red
296	02-1 (x)	Froze	Dead	Large	Pink
297	02-8 (x)	Dead	Dead	Medium	Red
298	02-8 (x)	1/2 green	1/2 green	Large	White
299	02-8 (x)	1/2 green	Dead	Medium	Red
300	02-8 (x)	Froze	Dead	Medium	Red, excellent
301	02-8 (x)	1/2 green	Dead	Small	Red

First frost Sept. 20 at 25 degrees.

Below freezing temperatures on following days:

9/20 - 25°

10/1 - 29°

10/25 - 16° - all plants froze

9/29 - 24°

10/20 - 25°

10/26 - 10° - " " "

9/30 - 29°

10/24 - 16°

Potatoes harvested 10/27/62

Louisiana table 2. Adaptation trials and performance summary of 1961 clones.

Seedling	Parentage	Specific gravity		Maturity	Chip Rating <sup>1</sup> /Darkening <sup>2</sup>	After cooking	Scab	
		Wisc. 1961	Wisc. 1961				Type <sup>3</sup>	Area Blight <sup>5</sup>
12-2	1859 x IaSoda	-	-	Late			0	0
12-4	1859 x IaSoda	1.082	1.078	Medium	4	2	4	40%
11-7	1859 x IaSoda	1.084	-	Med. Early			4	50%
12-8	52-42 (x)	1.076	1.075	Med. Early	5	2	0	0
11-27	91-78 x Katahdin	1.088	1.083	Early			3	20%
11-28	91-143 x Katahdin	1.080	1.073	Medium	3.5	3	3	20%
11-34	91-143 x Katahdin	1.085	1.075	Late	2.5	2	2	10%
11-36	91-143 x Katahdin	1.077	1.080	Medium	3	2	2	10%
11-39	91-143 x Katahdin	1.086	1.081	Late	3	2	2	10%
11-40	91-143 x Katahdin	1.074	1.089	Late	3	2	3	20%
12-48	Ag. 29 (x)	1.094	1.091	Very Early	4	1	0	0
11-57	Ag. 59 (x)	1.089	1.085	Late	3	1	3	30%
12-63	22-153 (x)	1.070	-	Medium			4	20%
11-64	B 3692-4 (x)	1.079	1.074	Med. Early	5	2	4	60%
11-66	B 3692-4 (x)	1.073	-	Late			1	20%
12-67	B 3692-4 (x)	-	-	Medium				
11-72	61-193 x 91-78	1.075	1.077	Med. Late	4	4	3	60%
11-80	306-37 x Katahdin	1.089	1.077	Med. Early	3.5	4	3	30%
12-83	1859 x IaSoda	1.079	1.076	Late	5	2	3	10%
11-85	1859 x IaSoda	1.076	1.065	Early	7	1.5	2	20%
11-96	91-78 x Katahdin	1.090	1.077	Late	3	4	0	0
11-97	91-78 x Katahdin	1.083	1.083	Early	5	4	1	20%
11-102	91-78 x Katahdin	1.085	1.086	Medium	3	1	2	10%
11-128	Katahdin (x)	1.071	1.080	Med. Late	3		3	30%
12-142	22-153 (x)	-	-	Late			3	20%
11-150	B 3692-4 (x)	1.072	1.079	Very Early	3	3	4	40%
12-157	Katahdin x B 3692-4	1.078	1.084	Very Early	5	2	2	10%
11-158	Katahdin x B 3692-4	1.080	1.079	Early	3.5	1	2	30%
12-166	72-122 x 62-80	1.086	1.094	Late	4	3.5	4	40%
12-167	72-122 x 62-80	1.087	1.087	Medium	4		4	40%
11-169	72-122 x 62-80	1.083	1.080	Medium	4	Golden	3	40%
11-170	Rushmore x B 3692-4	-	-	Medium				

1/Rating according to color chart of Procter &amp; Gamble Scale of 1-10; the lower the rating the lighter the chip color.

2/1 = white; 2 = cream; 3 = yellow; 4 = black. 3/Scab-Pustule Type. 0=no scab; 1= small superficial; 2=large, still superficial; 3=large, rough pustule; 4=large, pitted. 4/Percent area covered. 5/Blight: - = no blight; + = blight.

Red LaSoda type four with 60% coverage and LaRouge type three with 10% coverage.

Late Blight. Potatoes were planted in the blight chamber and two weeks after emergence were inoculated with the blight organism (Phytophthora infestans). The study is reported below and in table 2.

Red LaSoda	+	11-57	-
LaRouge	+	12-63	-
LaChipper	-	11-64	-
61-125	+	11-66	-
62-162	-	11-80	-
12-4	-	12-83	+
11-7	-	12-142	-
12-8	+	11-158	-
11-27	-		
<hr/>			
+ = Susceptible, showing blight			
- = Resistant, no blight showing			

Quality continues to be one of our most important breeding objectives and the factors being studied at this station are specific gravity, chipping, baking and after-cooking darkening. One study has been undertaken to determine the amount of variability within lines relative to solids and yield when grown in the North as compared to the South.

Data presented in Louisiana table 2 show that 11-34 is our best 1961 clone in chipping; these data show that several lines are not subject to after-cooking darkening. A few entries in this table show very little variation in total solids.

Chip ratings and specific gravity data for various seedlings and varieties are presented in Louisiana table 3. LaChipper ranked first in chipping ability as well as specific gravity.

#### Outfield Variety Tests

The primary purpose of conducting these tests is to obtain data on the adaptability of promising seedlings and new varieties as compared to existing varieties. Yield and quality are definitely influenced by variations in environmental and growing conditions. Therefore, tests are conducted at as many locations as seems feasible in an effort to make reliable evaluations of these varieties and seedlings.

Replicated yield trials were conducted at 6 south Louisiana locations and five north Louisiana locations. These locations included tests at the main station and sub-stations as well as individual farms.



Louisiana table 3. Other quality studies.

Variety or Seedling	Chip Rating*	After Cooking Darkening**	Specific Gravity***
Red LaSoda	5.0	1.0	1.062
Katahdin	4.0		1.065
Sebago	3.0		1.057
Cobbler	4.0	2.0	1.075
Rushmore	4.0		1.067
Burbank	4.0	3.0	1.067
White Rose	4.5		1.059
Early Gem	4.5		1.064
Norland	3.5	4.0	1.070
Catoosa	4.0	2.5	1.065
LaRouge	5.0		1.065
LaChipper	2.5	1.5	1.075
91-143	4.0		1.070
61-125	3.5		1.074
62-162	4.5		1.060

\* Rating according to color chart of Procter & Gamble Scale of 1-10; the lower the rating the lighter the chip color.

\*\* 1 = white; 2 = cream; 3 = yellow; 4 = black.

\*\*\*Grown at New Roads, Louisiana.

All of the plantings were spaced one foot apart on rows from 4 to 6 feet wide. Results of these tests are given in Louisiana table 4.

When evaluating the entries at each location, it may be noted that Red LaSoda and LaRouge, formally Seedling 42-45, produced yields among the top four entries at every location. LaRouge has the ability to set more potatoes per hill than Red LaSoda and shows a degree of resistance to scab. Observations of fall plantings in Louisiana indicate that LaRouge yields even better than Red LaSoda. In the northern seed-growing states this variety is approximately two weeks earlier than Red LaSoda. N. D. 3815-1R, grown at only two locations, produced yields comparable to LaRouge and Red LaSoda. This seedling has vigor and good skin color, however, cracking may be a problem under Louisiana conditions. Catoosa also produced good yields. Norland produced low yields and has a pale red skin color under Louisiana conditions. However, this variety is early and has good quality as well as scab resistance.

LaChipper, Sebago, and Katahdin were the most consistent yielding white-skinned selections. LaChipper, formerly Seedling 91-78, has some resistance to late blight and shows promise as an excellent chipping variety under Louisiana conditions. This variety is a Cobbler type; however, it is less susceptible to scab than Cobbler. Sebago is highly susceptible to blackleg and when grown in Louisiana this variety is not as good a chipping variety as LaChipper. White Rose produced high total yield; however, this variety is irregular in shape and is low in quality. It is not recommended for Louisiana.

The yield comparisons of LaRouge, LaChipper and Seedling 62-162 as compared to other varieties for a five-year period are shown in Louisiana table 5. LaRouge has produced the highest yield for the 5-year average. LaChipper has been the highest yielding white-skinned variety on the 5-year average. Red LaSoda and

Katahdin have also been consistent performers.

The yield and specific gravity of certain varieties and seedlings grown at Baton Rouge, Louisiana, are presented in Louisiana table 6. These selections include virus X free and certified seed of some varieties. No difference in yield was noted between the two sources of seed. However, both sources of seed produced vigorous plants and high yields. Varietal differences for yielding ability were obtained. Red Pontiac, Red LaSoda, Norland and LaRouge produced comparable yields. All these varieties were similar in specific gravity. Snowflake was the outstanding white-skinned variety while Sebago and LaChipper also produced good yields. Seedling N. D. 3022-18 is an attractive potato shaped like a baseball with smooth tough skin.

Louisiana table 4. Yields of Irish potato varieties and seedlings from several Louisiana locations, 1962.

Variety or Seedling	Plaquemines Parish			Donaldsonville			Thibodaux--Francis			New Roads		
	Experiment Station			Noel's			T. Nicholls St. Col.			Beaud's		
	U.S.#1's	Yield per acre	Total	U.S.#1's	Yield per acre	Total	U.S.#1's	Yield per acre	Total	U.S.#1's	Yield per acre	Total
	Cwt.		Cwt.	Cwt.		Cwt.	Cwt.		Cwt.	Cwt.		Cwt.
Red LaSoda	201.2		230.0	135.9		143.8	136.5		147.7	196.3		228.5
Katahdin	139.0		170.3	98.6		109.2	94.0		105.7	141.6		177.8
Sebago	162.1		184.3	112.0		120.7	83.9		95.3	132.2		152.8
Cobbler	115.0		159.0	77.4		88.9	-		-	88.0		127.1
Rushmore	92.3		114.5	95.0		101.5	-		-	110.0		133.3
Burbank	81.0		122.0	75.2		87.8	-		-	71.5		160.5
White Rose	179.5		236.9	-		-	97.5		105.4	107.3		211.1
Early Gem	85.8		115.4	-		-	-		-	90.7		134.6
Norland	100.2		122.0	89.5		99.4	-		-	82.4		112.6
Catoosa	-		-	-		-	106.0		127.7	-		-
LaRouge	178.6		206.1	133.5		141.5	126.7		140.8	150.7		177.8
LaChipper	89.8		121.6	106.4		116.3	114.7		129.9	126.0		161.6
91-143	98.5		127.3	94.6		103.7	58.9		71.6	78.5		95.6
61-125	97.6		129.8	90.9		103.7	91.3		108.4	125.6		157.4
62-162	150.3		201.2	89.8		105.9	116.0		129.1	86.5		137.5
6937	-		-	-		-	70.8		89.0	-		-
6894	-		-	-		-	110.6		120.1	-		-
N.D. 4524-7R	-		-	-		-	-		-	126.5		156.7
N.D. 3815-1R	-		-	-		-	-		-	161.8		192.2
N.D. 4192-3	-		-	-		-	-		-	87.8		125.8
L.S.D. .05	31.7			12.6			16.1			35.9		
L.S.D. .01	42.6			17.0			21.7			48.2		



Louisiana table 4, continued.

Variety or Seedling	Hammond		Baton Rouge		Chase		Oak Grove	
	Frt. & Trk. Expt. Sta.		Ben Hur Farm		Sweet Potato Center		J. C. Sowell	
	Yield per acre	Total	Yield per acre	Total	Yield per acre	Total	Yield per acre	Total
	U.S.#1's	Cwt.	U.S.#1's	Cwt.	U.S.#1's	Cwt.	U.S.#1's	Cwt.
Red LaSoda	156.9	172.1	132.7	181.7	136.4	217.1	67.7	108.2
Katahdin	130.7	149.5	79.0	103.7	90.8	132.4	71.3	106.3
Sebago	121.4	138.2	96.7	121.4	95.4	140.7	61.5	81.2
Cobbler	110.0	143.2	58.7	91.2	-	-	-	-
Rushmore	106.5	122.2	77.4	106.6	72.5	105.6	64.3	94.4
Burbank	-	-	85.9	113.9	-	-	-	-
White Rose	-	-	120.4	152.9	-	-	-	-
Early Gem	123.7	135.7	49.4	102.7	-	-	-	-
Norland	129.5	141.3	71.9	109.6	-	-	-	-
Catoosa	158.2	176.6	-	-	84.1	125.2	48.9	80.4
LaRouge	155.9	169.0	114.7	142.0	130.4	189.8	60.2	93.9
LaChipper	148.5	168.7	93.2	124.1	123.4	190.8	67.9	102.7
91-143	125.2	141.4	44.3	73.4	111.6	166.5	87.7	135.7
61-125	-	-	50.5	86.5	75.0	120.8	34.4	64.9
62-162	185.5	209.5	59.3	106.8	93.5	137.4	67.2	100.3
6937	-	-	79.4	96.0	87.8	136.9	39.2	78.9
6894	-	-	97.5	132.7	-	-	-	-
N.D. 4524-7R	-	-	49.1	91.8	-	-	-	-
N.D. 3815-1R	-	-	101.9	132.5	-	-	-	-
N.D. 4192-3	-	-	40.6	80.2	-	-	-	-
L.S.D. .05								
L.S.D. .01								

Louisiana table 4, continued.

Variety or Seedling	Rayville		Rayville		Calhoun		Average of All Locations	
	Howard Bennett		H. Smith		N. La. Expt. Sta.		Yield per acre	
	U.S.#1's	Total	U.S.#1's	Total	U.S.#1's	Total	U.S.#1's	Total
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Red LaSoda	142.4	198.1	160.6	204.2	162.2	202.0	148.1	184.9
Katahdin	102.0	147.4	112.6	143.1	89.3	124.3	104.4	109.3
Sebago	110.6	149.8	97.0	125.2	117.6	144.5	108.2	132.2
Cobbler	-	-	-	-	-	-	89.8	121.9
Rushmore	73.6	110.7	83.8	111.5	70.4	116.8	84.6	111.7
Burbank	-	-	-	-	-	-	78.4	121.1
White Rose	-	-	-	-	-	-	126.2	176.6
Early Gem	-	-	-	-	-	-	87.4	122.1
Norland	72.0	138.4	77.9	113.7	63.2	118.8	82.0	116.1
Catoosa	112.7	154.5	132.0	165.5	115.7	153.3	116.5	151.6
LaRouge	112.4	158.2	111.1	137.4	116.8	172.0	126.5	158.0
LaChipper	116.1	182.2	104.5	147.1	87.3	140.1	107.8	144.9
91-143	72.8	114.6	100.8	129.2	77.3	120.2	78.2	105.7
61-125	102.9	148.5	108.6	151.4	85.4	137.6	91.4	126.1
62-162	101.7	185.4	96.0	150.8	98.8	153.2	101.0	145.0
6937	-	-	-	-	-	-	75.1	92.5
6894	-	-	-	-	-	-	104.1	126.4
N.D. 4524-7R	-	-	-	-	-	-	87.8	124.3
N.D. 3815-1R	-	-	-	-	-	-	131.9	162.4
N.D. 4192-3	-	-	-	-	-	-	64.2	103.0
L.S.D. .05								
L.S.D. .01								

Louisiana table 5. Yields of LaRouge, LaChipper and 62-162 as compared to other varieties over a 5-year period, 1958-1962.

Variety or Seedling	Yield of No. 1's in CWT Per Acre					Average
	1958	1959	1960	1961	1962	
Red LaSoda	86.9	171.1	202.9	193.2	132.7	157.4
Katahdin	93.4	142.0	165.7	142.8	79.0	124.6
Sebago	47.6	111.5	115.2	157.5	96.7	105.7
Rushmore	86.5	112.0	124.0	110.9	77.4	102.2
LaRouge (42-45)	113.3	179.8	194.5	216.2	114.7	163.7
LaChipper (91-78)	80.5	137.6	162.9	169.1	93.2	128.7
62-162	81.5	186.2	161.5	145.7	59.3	126.8

Louisiana table 6. Yield and specific gravity of varieties and seedlings grown at Baton Rouge, Ben Hur Farm, 1962.

Variety or Seedling	CWT/Acre		Specific Gravity
	U. S. No. 1's	Total	
Red LaSoda	132.7	181.7	1.064
Red Pontiac (Certified)	137.9	173.0	1.069
Red Pontiac (X-Free Seed)	146.3	174.6	1.067
Norland (Certified)	127.2	145.9	1.067
Norland (X-Free Seed)	116.9	147.5	1.067
LaRouge (42-45)	114.7	142.0	1.067
N.D. 4524-16R	95.5	131.8	1.079
TL 6896	-	-	1.070
Snowflake	115.0	139.7	1.070
N.D. 3022-1-8	88.9	103.7	1.075
LaChipper (91-78)	93.2	124.1	1.072
Rushmore	77.4	106.6	1.076
Russet Burbank	85.9	113.9	1.082
White Rose	120.4	152.9	1.068
Early Gem	49.4	102.7	1.069
Sebago	96.7	121.4	1.069
Katahdin	79.0	103.7	1.075



MAINE

Hugh J. Murphy, Allen E. Scharf, Michael Goven

Cooperative variety trials were conducted during 1962 at Presque Isle and Fort Fairfield in Central Aroostook County and at Exeter in Central Maine. Planting in Aroostook County was on schedule but delayed in Central Maine because of soil conditions. June was normal in terms of temperature and rainfall but July, August, and September were unfavorable for growth and dry matter production. The harvesting season was difficult because of extremely wet soil conditions and cool temperatures.

The parentage and characteristics of the named varieties and numbered seedlings tested in 1962 are presented in Maine table 1. Yields of all varieties at all locations were above normal in 1962 but specific gravities were below normal for most varieties. Yields and specific gravities by location are presented in Maine table 2.

In 1962 the Allehanna, Ona, and Kennebec were outstanding in yield, while seedlings B3692-4 and B4491-12 were excellent in yield performance. Mohawk, Kennebec, B3563-2 and B4491-12 appeared to be highest in specific gravity. Cobbler, Earlane #2, Ona, and many seedling varieties failed to produce satisfactory yields of Size A ( $2\frac{1}{4}$ -4 inches) tubers as shown in Maine table 3.

Results of the fall chipping and french fry studies are presented in Maine tables 4 and 5. Color indices were all high or dark in 1962 because of lack of physiological maturity and cool temperatures at harvesttime. Golden Chip and Kennebec continue to be the most satisfactory varieties for chipping in Maine.

Maine table 1. Parentage and characteristics of varieties and seedlings in cooperative yield trials, Maine, 1962.

Variety	Parentage	Maturity	Skin Color	Disease resistance <sup>1/</sup>
Allehanna	Unknown	M	W	
Antigo	Menominee x Wis. 302.44-6	E	C	Sc.
Avon	96-56 x 1464	M	C	Lb., Sc.
Cobbler	Unknown	E	W	Virus A.
Earlane #2	I. Cobbler x 43055	E	W	Virus A.
Fundy	Keswick x 96-56	E	W	Lb.
Golden Chip	(B127 x 96-56)	M	W	Lb., NN., virus A
Katahdin	40568 x 24642	L	C	Lr., NN., virus A
Kennebec	B127 x 96-56	M	W	Lb., NN., virus A
Mohawk	Gr. Mountain x Katahdin	L	B	Lb., Sc., rhizoc.
Norland	Redkote x ND626	E	R	Sc.
Ona	B3021-3 x B2968-31	M	W	Lb., Sc., vert. wilt.
Snowflake	Kennebec x ND457-1	E	W	Virus Y
Superior	B96-56 x M59.44	M	W	Sc.

continued

Maine table 1, continued.

B3353-16	B355-24 x B911-31	M	C	Lb., RR.
B3424-11	B595-76 x B936-12	L	C	Lb., Sc.
B3478-45	B721-30 x Teton	M	W	RR., virus Y
B3563-2	(X927-3) x Katahdin	M	W	Lr., virus Y
B3692-4	B2919-1 x Ac 25953	L	W	Lb., Sc., virus Y
B4273-18	B595-76 x ND457-1	E	W	Lr.
B4491-12	B3391-2 x B3944-11	M	W	Lr.
B721-29	Earlaine x Teton	L	C	RR., virus Y
F4613	S. demissum, Kat., Gr. Mt.,			
	I. Cobbler	L	C	Lb., Sc.
WY1122	47096 selfed	M	C	RR., virus Y

1/ Late blight resistance is to the common race of the organism.

Net necrosis is a tuber necrosis caused by current-season leaf roll infection.

Maine table 2. Yield and specific gravity of potato varieties grown at 3 locations in Maine, 1962.

Variety	Presque Isle		Fort Fairfield		Exeter	
	Yield per acre	Specific gravity	Yield per acre	Specific gravity	Yield per acre	Specific gravity
	Cwt.		Cwt.		Cwt.	
Alleghanna	397	1.068	349	1.069	317	1.065
Antigo	360	1.066	303	1.074	270	1.069
Avon	325	1.070	304	1.077	265	1.070
Cobbler	347	1.077	318	1.081	305	1.077
Earlaine #2	443	1.059	276	1.070	248	1.068
Fundy	299	1.066	295	1.076	301	1.074
Golden Chip	403	1.079	363	1.077	363	1.070
Katahdin	399	1.077	329	1.076	283	1.069
Kennebec	408	1.080	336	1.081	349	1.071
Mohawk	404	1.089	283	1.080	288	1.075
Norland	321	1.063	296	1.068	255	1.064
Ona	393	1.077	277	1.073	323	1.066
Snowflake	347	1.068	293	1.069	271	1.067
Superior	315	1.068	291	1.077	283	1.072
B3353-16	347	1.073	295	1.070	267	1.064
B3424-11			206	1.073	265	1.066
B3478-45	368	1.072	324	1.075	340	1.070
B3563-2	366	1.084	297	1.089	337	1.078
B3692-4	419	1.066	344	1.068		
B4273-18	343	1.067	317	1.070	269	1.065
B4491-12	392	1.081	334	1.089	359	1.071
B721-29 <sup>1/</sup>	403	1.081	272	1.069	313	1.068
F4613	310	1.070	297	1.077	246	1.072
WY1122	299	1.066	295	1.069	301	1.064
L.S.D. 0.05	57	0.001	41	0.003	57	0.005
0.01	75	0.002	54	0.005	75	0.007

1/ Seedpieces of B721-29 were spaced 10 inches apart. All other varieties spaced 8 inches apart.

Maine table 3. Percentage of yield between 1 7/8 and 4 inches in size for potatoes grown at three locations in Maine, 1962.

Variety	Presque Isle		Fort Fairfield		Exeter	
	Class	Class	Class	Class	Class	Class
	1 7/8-4 inches	2 1/4-4 inches	1 7/8-4 inches	2 1/4-4 inches	1 7/8-4 inches	2 1/4-4 inches
Allehanna	98	88	98	82	98	92
Antigo	97	77	93	64	92	78
Avon	97	86	95	66	96	78
Cobbler	94	66	82	42	94	67
Earlaine #2	95	77	88	45	95	71
Fundy	94	76	92	67	98	83
Golden Chip	94	80	96	70	99	93
Katahdin	96	79	94	61	98	82
Kennebec	96	80	95	63	99	91
Mohawk	97	86	96	74	97	90
Norland	96	71	90	56	96	76
Ona	94	63	86	34	96	66
Snowflake	94	69	93	62	97	82
Superior	93	78	95	70	97	84
B3353-16	96	78	95	57	98	83
B3424-11			95	73	97	84
B3478-45	96	68	90	48	98	83
B3563-2	96	79	94	65	97	87
B3692-4	95	76	92	54		
B4273-18	98	86	97	82	96	86
B4491-12	96	81	93	62	97	84
B721-29	94	68	90	41	96	76
F4613	97	80	91	66	96	76
WY1122	96	76	92	58	97	82
Planted	May 14		May 18		June 1	
Killed	September 7		August 29		September 28	
Harvested	September 19		September 13		October 13	
Sized	September 20		September 18		October 16	
Sp. gr. determined	October 28		October 25		November 6	
Fertilizer, lbs./A	120-180-180		130-130-130		130-130-130	

Maine table 4. French fry color and texture indices for potato varieties grown at Fort Fairfield, 1962<sup>1</sup>/

Variety	Color index	Texture index
Allehanna	9.5	1.2
Antigo	7.0	1.1
Avon	6.1	1.0
Cobbler	7.8	1.0
Earlaine #2	7.3	1.3

continued



Maine table 4, continued.

Fundy	7.5	1.1
Golden Chip	6.9	1.0
Katahdin	8.0	1.0
Kennebec	7.0	1.0
Mohawk	8.2	1.1
Norland	6.9	1.0
Ona	7.7	1.1
Snowflake	7.9	1.0
Superior	6.9	1.0
B3353-16	5.8	1.0
B3424-11	8.7	1.8
B3478-45	8.9	1.0
B3563-2	7.8	1.4
B3692-4	6.7	1.2
B4273-18	7.6	1.2
B4491-12	7.1	1.0
B721-29	10.0	1.1
F4613	7.0	1.1
WY1122	8.6	1.0
L.S.D. 0.05	0.7	0.3
L.S.D. 0.01	0.9	0.4

1/ French fries with the lower index numbers are lighter in color and lower texture indices indicate mealier texture.

Maine table 5. Chip color indices for potato varieties grown at three locations in Maine, 1962<sup>1/</sup>

Variety	Presque Isle <sup>2/</sup>	Exeter	Fort Fairfield
Allehanna	10.0	10.0	10.0
Antigo	10.0	8.8	7.9
Avon	7.0	8.0	7.2
Cobbler	9.8	9.8	9.4
Earlaine #2	10.0	9.9	8.7
Fundy	10.0	10.0	9.2
Golden Chip	8.4	8.8	8.4
Katahdin	10.0	10.0	9.1
Kennebec	9.0	8.2	7.5
Mohawk	10.0	10.0	9.8
Norland	9.8	8.7	7.9
Ona	10.0	10.0	9.7
Snowflake	9.6	9.6	9.4
Superior	10.0	8.5	8.3
B3353-16	10.0	9.2	8.2
B3424-11		10.0	9.8
B3478-45	10.0	10.0	9.7

continued

Maine table 5, continued

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B3563-2	9.2	10.0	9.3
B3692-4	10.0		8.8
B4273-18	10.0	10.0	9.3
B4491-12	8.7	8.6	7.8
B721-29	10.0	9.9	10.0
F4613	9.0	9.3	8.3
WY1122	10.0	9.9	9.8
L.S.D. 0.05		0.5	0.6
L.S.D. 0.01		0.7	0.8

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1/ Chips with lower index numbers are lighter in color.

2/ Replicated samples lost because of faulty storage thermostat.

## MAINE

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## Leafroll Resistant Seedlings

In 1962, field testing for resistance to leafroll was continued following the procedure used in previous years (Maine Bul. 502).

As indicated last year, new introductions are now brought from Chapman after some selection for other characters has been made. This is the last year for testing family lines in toto.

Relatively few of the Chapman selections are resistant and only these resistant ones are reported.

Ten advanced seedlings were again tested for yielding ability, specific gravity and size distribution. See Maine tables 9 and 10 for details of culture.

Results since 1959 introductions are given in Maine tables 6 to 8.

Maine table 6. Reaction of progenies of different crosses and selfed lines to leafroll infection resulting from artificial inoculations with viruliferous green peach aphids in each of 3 successive seasons. 1959-61.

Pedigree <sup>1/</sup>	Parentage	Not showing primary leafroll in August			Healthy in 1962 <sup>2/</sup>
		1959	1960	1961	
		No.	No.	No.	
B 4749	B 3393-1 x B 24-58	30/523	27/30	18/27	1/1
B 4776	Ac 180-26 x B 2834-3	5/214	5/5	2/5	0/1
B 4790	Ac 26025 x B 2834-3	17/444	12/17	3/12	1/1
B 4793	Ac 26025 x B 4095-1	27/254	23/27	7/23	1/2

1/ Four crosses remaining out of 15 crosses and 0 selfed lines out of 7 that were represented in 1959.

2/ Reading on 5-hill lots not infested in 1962 with viruliferous green peach aphids.

Maine table 7. Reaction of progenies of different crosses and selfed lines to leafroll infection resulting from artificial inoculation with viruliferous green peach aphids in each of 3 successive seasons. 1960-1962.

Pedigree <sup>1/</sup>	Parentage	Not showing primary leafroll in August			Healthy in 1962 <sup>2/</sup>
		1960	1961	1962	
		No.	No.	No.	
B 4997	B 2834-3 x B 3556-12	3/310	1/2	0/1	0/1
B 5007	B 3397-17 x B 4168-5	14/340	7/14	3/7	3/7
B 5014	B 3556-12 x B 4087-5	3/189	1/3	0/1	1/1
B 5015	B 3556-12 x B 4154-2	19/501	5/17	3/5	5/5
B 5028	B 4095-1 x B 3556-12	66/552	9/66	5/9	5/9
B 5029	B 4095-1 x B 4168-4	41/304	13/41	1/6	4/6
B 5034	B 4154-2 x B 3391-2	41/604	3/42	1/3	1/3
B 5040	X 1276-185 x B 3556-12	94/876	20/94	2/16	9/16
B 5094	B 4095-7 x B 3556-12	12/152	1/12	0/1	0/1
B 5119	Houma x B 24-58	37/302	11/38	5/11	4/11
B 5148	B 3556-12 x B 3646-11	1/586	1/1	0/1	0/1

1/ Crosses remaining of those first introduced in 1960.

2/ Not infested with viruliferous aphids in 1962 as a check to identify seedlings infected with leafroll but not showing primary symptoms after inoculation in 1961.



Main table 8. Selections from Chapman<sup>1/</sup> in 1961 not showing current season symptoms of leafroll following inoculation with viruliferous green peach aphids in July, 1962.

Pedigree	Parentage	Not showing primary leafroll in August 1962
B 5001-3	B 3139-24 x B 2834-3	5/5
B 5003-4	B 3139-24 x B 4154-2	5/5
B 5006-4	B 3397-17 x B 3591-1	4/5
B 5006-6	B 3397-17 x B 3591-1	5/5
B 5006-22	B 3397-17 x B 3591-1	5/5
B 5012-18	B 3556-12 x B 3478-45	5/5
B 5015-2	B 3556-12 x B 4154-2	5/5
B 5015-14	B 3556-12 x B 4154-2	5/5
B 5015-16	B 3556-12 x B 4154-2	4/4
B 5015-20	B 3556-12 x B 4154-2	4/4
B 5016-29	B 3725-1 x Yampa	4/5
B 5023-44	B 3950-1 x B 3556-12	5/5
B 5025-1	B 4087-5 x B 2368-4	5/5
B 5031-4	B 4116-2 x B 4154-2	5/5
B 5031-7	B 4116-2 x B 4154-2	5/5
B 5031-12	B 4116-2 x B 4154-2	5/5
B 5031-13	B 4116-2 x B 4154-2	4/5
B 5031-18	B 4116-2 x B 4154-2	5/5
B 5031-24	B 4116-2 x B 4154-2	5/5
B 5041-2	B 24-78 x Kennebec	5/5
B 5063-3	Houma x B 2368-4	5/5
B 5064-5	Katahdin x Merrimack	5/5
B 5064-6	Katahdin x Merrimack	5/5
B 5159-16	B 4087-5 x B 3556-12	5/5
B 5160-5	B 4168-3 x Merrimack	4/5

<sup>1/</sup> Two hundred and eighty-three entered in the test.

Maine table 9. Yield, specific gravity and size distribution of 10 leafroll-resistant varieties and 4 standard varieties, 1962.

Variety	Total yield per acre	Specific gravity	Yield 2½"-4" per acre	Per cent yield 2½"-4"
	Cwt.		Cwt.	Pct.
B 4793-21	587.8	1.0756	496.6	84
B 4849-6	539.2	1.0736	449.7	83
Kennebec	492.7	1.0784	397.4	81
B 4343-2	481.4	1.0722	356.7	74
B 4123-10	478.4	1.0690	286.0	60
B 4843-14	473.5	1.0814	359.8	76
B 4491-12	471.4	1.0803	372.1	79
Cobbler	452.5	1.0801	307.5	68
Katahdin	447.5	1.0752	351.3	78
B 4273-18	436.9	1.0711	369.0	84
B 4335-1	431.7	1.0635	296.0	69
B 4490-5	413.7	1.0790	261.4	63
Russet Burbank	413.7	1.0798	395.9	96
B 4239-46	398.3	1.0747	301.3	76
L.S.D. 5%	53.9	.0033	54.1	

Maine table 10. Yields and reaction of 20 leafroll resistant seedlings and 4 standard varieties infested with viruliferous green peach aphids, 1961.

Variety	Parentage	Yield per acre	Primary leafroll in August <sup>1/</sup>
		Cwt.	Pct.
B 579-3	B 24-58 x Katahdin	256	0
B 4123-10	B 2925-23 x B 2359-84	400	0
B 4239-46	Houma x B 3556-12	329	2
B 4273-18	B 595-76 x ND 457-1	351	4
B 4335-1	Houma x B 294-38	372	12
B 4343-2	B 2962-6 x ND 457-1	425	0
B 4490-5	B 3391-2 x B 3556-12	366	6
B 4491-12	B 3391-2 x B 3944-11	442	4
B 4790-3	Ac 26025 x B 2834-3	463	0
B 4793-21	Ac 26025 x B 4095-1	430	0
B 4803-2	B 294-29 x B 2834-3	315	0
B 4843-14	B 4088-4 x B 4154-2	405	0
B 4849-6	X 1276-185 x B 2834-3	471	8
B 4893-24	B 24-58 x B 2834-3	302	4
B 5028-48	B 4095-1 x B 3556-12	357	0
B 5029-2	B 4095-1 x B 4168-4	350	10
B 5029-26	B 4095-1 x B 4168-4	377	10
B 5029-38	B 4095-1 x B 4168-4	488	0
B 5040-10	X 1276-185 x B 3556-12	315	24
B 5119-35	Houma x B 24-58	524	0
Chippewa		391	100
Green Mountain		283	100
Katahdin		218	100
Kennebec		325	100

<sup>1/</sup> Average of 5 replications of 10 hills each--seed spacing 12 inches.

MAINE

F. E. Manzer, Donald Merriam, R. V. Akeley and A. E. Schark

Ring-Rot Resistant Seedlings

The results of these annual tests, as previously indicated, are reported one year late in order that tubers of selections appearing disease free or questionable in the field can be checked after a storage period of 5 or 6 months.

As in the 1960 tests only selections shown in previous plantings to have commercial promise were inoculated in 1961. Of 265 such selections 11 showed no evidence of the disease and 8 showed only slight symptoms (Maine table 11).

Reinoculation of 42 selections from previous tests yielded 15 which showed evidence of infection (Maine table 12). It is interesting to note that none of these seedlings showed visual symptoms of ring rot in the foliage, and the infections were discovered by Gram stain tests. It will be seen also from Maine table 12 that most of the seedlings which gave positive Gram tests did not show symptoms of infection in the tubers.

In 1962 a 4-year investigation of several ring rot-resistant seedlings as possible carriers of the disease was concluded. None of the seedlings so tested was found to transmit the disease to a susceptible even though in the early trials, a 4-year incubation period was provided.

Each year 10 advanced ring rot-resistant selections from this program are compared with four standard varieties for yielding ability, specific gravity and size distribution. The test plots are single 34-inch rows, 20 feet long. Each entry is replicated 5 times in randomized complete blocks. The seed is planted at 9 inches except for Russet Burbank which is spaced at 18 inches. In 1962 the test was planted May 28 using 1300 pounds of a 10-10-10 fertilizer and recommended cultural and pest control practices were followed during the growing season. The plots were treated with sodium arsenite on September 17, and harvested on October 2. The results of this trial are reported in Maine table 13.

Maine table 11. Advanced selections showing resistance in 5-hill ring rot inoculation tests, 1961 <sup>1/</sup>

Pedigree	Parentage	Plants infected <sup>2/</sup>	Tubers infected <sup>2/</sup>
B 4751-2	B 3428-41 x B 3139-24	0/5	0/38
B 4771-9	Yampa x B 3609-19	0/5	0/30
B 4799-2	Ac 26031 x B 3478-45	0/5	0/30
B 4799-11	Ac 26031 x B 3478-45	0/5	0/51
B 4805-2	B 595-76 x B 2368-4	0/5	0/43
B 4809-14	B 922-3 x B 3478-45	0/5	0/33
B 4828-11	B 3139-24 x B 2368-4	0/5	3/29
B 4835-7	B 3556-12 x B 3478-45	0/5	0/46
B 4835-12	B 3556-12 x B 3478-45	0/5	0/49
B 4850-32	1276-185 x B 3944-29	1/5	3/52
B 4857-1	Ac 26033 x B 3114-67	1/5	0/52
B 4876-2	B 2331-5 x B 3646-11	0/5	2/20

continued



Maine table 11, continued.

B 4878-2	B 3139-24 x B 3556-12	1/5	20/30
B 4878-7	B 3139-24 x B 3556-12	0/5	0/22
B 4878-14	B 3139-24 x B 3556-12	0/5	4/46
B 4885-2	WV 14-17 x B 3478-45	0/5	0/50
B 1590-2	B 3139-24 (X)	5/5	0/29
B 1590-7	B 3139-24 (X)	0/5	0/29
B 3955-2	Not available	0/5	9/67
Katahdin Checks (inoculated in 5-hill lots)		236/265	--

1/ In 1961 a total of 265 such seedlings and named varieties were tested.

2/ Fractions indicate number infected/number examined.

Maine table 12. Advanced selections previously reported as resistant to ring rot, showing susceptibility in 5-hill reinoculation tests<sup>1/</sup>, 1961.

Pedigree	Parentage	Plants infected <sup>2/</sup>	Tubers infected <sup>3/</sup>
B 3114-67	B 503-70 x 991-13	4/5	--
I 1092-2	Iowa seedling	4/5	--
B 4134-26	B 784-53 x B 24-58	0/5	1/38
B 4239-23	Houma x B 3556-12	4/5	--
B 4154-4	B 24-58 x B 3195-3	4/5	--
B 4483-5	B 2331-5 x B 3139-24	4/5	0/39
B 4485-1	B 3097-82 x B 3139-24	2/5	0/34
B 4485-9	B 3097-82 x B 3139-24	1/5	0/35
B 4617-2	792-88 x B 139-24	1/5	0/52
B 4289-11	B 902-2 x Merrimack	5/5	0/27
B 4169-3	B 3102-3 x B 355-24	5/5	0/46
B 3478-23	B 721-30 x Teton	5/5	0/38
B 3142-6	B 721-29 x Teton	4/5	--
B 3856-7	B 3102-3 x Teton	5/5	1/34
B 3353-16	B 355-24 x B 911-31	5/5	1/37
Katahdin Checks (inoculated in 5-hill lots)		29/45 <sup>4/</sup>	

1/ A total of 42 such selections were retested in 1961.

2/ Plants infected/plants examined--Gram stain tests used.

3/ Tubers infected/tubers examined--Gram stain not used.

4/ Gram test not used.

Maine table 13. Yield, specific gravity, and size distribution of 10 ring rot resistant varieties and 4 standard varieties, 1962.

Variety	Total yield per acre	Specific gravity	Yield per acre 2½"-4"	Yield 2½"-4"
	Cwt.		Cwt.	Pct.
Kennebec	492.7	1.0784	397.4	81
B 3478-23	476.1	1.0784	288.3	61
Cobbler	452.5	1.0801	307.5	68
Katahdin	447.5	1.0752	351.3	78
B 3681-1	437.5	1.0670	288.3	66
B 2895-31	433.4	1.0653	350.5	81
B 3856-7	429.4	1.0631	282.1	66
Wy 1122	429.4	1.0696	325.9	76
B 3353-16	428.8	1.0748	362.1	84
B 911-21	428.5	1.0730	325.2	76
Russet Burbank	413.7	1.0798	395.9	96
B 4289-7	398.8	1.0734	202.9	51
B 4289-11	391.6	1.0705	331.3	85
B 3478-45	391.1	1.0754	249.1	64
L.S.D. 5%	53.9	.0033	54.1	

MASSACHUSETTS  
Robert H. Mullany  
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1962 Potato Yield Tests

Three potato yield tests were planted in Eastern States' territory in 1962; one in Massachusetts and 2 in Pennsylvania, each location being in concentrated potato growing areas. The tests were planted in commercial growers' potato fields and, with the exception of planting, were treated culturally as their own. The experimental design was the randomized complete block, with five replicates at each location. Individual plots consisted of one 25-foot row with 10-inch spacing between plants. Sprayer rows were not involved in these tests. Test locations and the fertilizer and previous cropping practices followed by each cooperator are noted below.

The Fred Oswald farm in New Tripoli, Pennsylvania, has a shaly loam soil characteristic of some areas of Lehigh County. Cropping the previous year was a clover-orchardgrass mixture in a potato-wheat-hay rotation. Ten tons per acre of manure was plowed down, with 900 pounds per acre of a 10-20-10 fertilizer banded in 34-inch rows. The test planting date was May 10 and the harvest date October 17.

The test on the farm of Norman Whiteside in Oxford, Pennsylvania was planted in heavy loam soil. Potatoes were preceded by a clover-timothy mixture and wheat, respectively. One ton per acre of a 6-12-12 fertilizer was applied by the planter in 32-inch rows. Planting date was May 1 and date of harvest was October 15.

The farm of Michael Pasiecznik in Whately, Massachusetts has a sandy loam soil type. Previous cropping was to various vegetable crops, followed by a ryegrass cover crop. Eighteen hundred pounds per acre of 10-15-15 fertilizer was applied in 36-inch rows with the planter. The test was planted on May 16 and harvested on October 24.

Seed Sources. The Katahdin, Cobbler, Plymouth, and Keswick varieties were Maine-produced certified seed stocks. Norland was certified in Vermont. Seedlings B3802-15 and B3563-2 were provided by Hugh Murphy of the Maine Experiment Station and seedling 156.51-2 by Robert O'Keefe of the Department of Horticulture at the University of Nebraska. The Arenac stock planted in the Whately and New Tripoli tests was certified Michigan seed. All other seed stocks were supplied by A. E. Schark of the USDA (Maine).

Growing Conditions. Rainfall at New Tripoli was lacking in May and early June resulting in near-drought conditions and poor plant development by July 17. However, subsequent rainfall was ample at this location. At Oxford, July and September were very dry. Fortunately, temperatures at both locations were somewhat below normal, thereby, minimizing transpiration loss. The growing season at Whately, Massachusetts was also very dry, but irrigation was effective in producing adequate yields.



Supplementary Notes. Norland, Arenac, Emmet, B3802-15 and 156.51-2 were all noted as having a good set but small size, indicating that wider spacing or better moisture conditions would have improved yields. Seedling B3599-8 produced undesirable growth cracks, and seedlings B69-16 and B4473-3 were inclined to produce rough tubers. Emmet and Fundy tubers had shallow eyes, a desirable characteristic.

The results obtained from the Pennsylvania tests indicates the importance of environment in producing quality potatoes, especially for chipping. With only 2 days separating the harvest dates, and low temperatures not a factor, the samples from the Oxford test chipped significantly better than those from New Tripoli. In 1960 and 1961, the chipping tests on samples from the same two locations were comparable.

Source of Chipping Data. Extensive chipping data on most of the entries of both tests in Pennsylvania was supplied through the cooperation of J. Watts of the Wise Potato Chip Company of Berwick, Pennsylvania. The ratings on these tests, as recorded in Table II, is the average of nine weekly readings starting on October 19, and indicate the color stability of the various samples when held at 70° F. The ratings on the Whately, Massachusetts test entries were compiled by processing representative samples through the commercial chipping operation of the State Line Potato Chip Company of Wilbraham, Massachusetts, after being held at 70° F. for 6 weeks following harvest.

Eastern States table 1. Yield and percent of US No. 1 tubers and percent defects,\* 1961.

Entry	New Tripoli, Pa.			Oxford, Pa.			Whately, Mass.			Ave.	
	US No. 1		De-	US No. 1		De-	US No. 1		De-	US No. 1	
	Per Acre	fect		Per Acre	fect		Per Acre	fect		Yield	Per Acre
	Cwt.	Pct.	Pct.	Cwt.	Pct.	Pct.	Cwt.	Pct.	Pct.	Cwt.	
Katahdin	364	81	3.2	275	91	0.2	384	91	0.0	341	
Cobbler	171	72	0.8	198	80	1.5	291	85	4.0	220	
Norland	103	56	0.0	205	86	1.4	182	63	0.2	163	
Arenac	189	75	1.4	189	81	0.1	155	70	1.8	178	
B69-16	297	83	5.3	230	88	0.0	362	82	9.3	296	
Wy 1122	283	81	7.0	182	87	0.3	235	85	2.0	233	
B3802-15	102	49	1.3	208	80	0.7	216	79	0.0	175	
B3563-2	165	64	8.9	194	87	0.0	##247	80	0.9	-	
Fundy	103	68	0.9	-	-	-	250	87	5.2	-	
Keswick	171	83	1.7	-	-	-	202	89	0.6	-	
B3599-8	229	67	12.4	-	-	-	331	73	19.3	-	
I8140-1	191	74	6.2	148	82	0.3	-	-	-	-	
156.51-2	-	-	-	182	75	0.2	#192	66	0.0	-	
Superior	-	-	-	199	87	0.0	-	-	-	-	
Emmet	-	-	-	201	80	0.7	-	-	-	-	
Plymouth	-	-	-	-	-	-	307	90	0.8	-	
B4473-3	-	-	-	-	-	-	#191	68	14.1	-	
L.S.D.05 **29				**37			**64			**24	

\* Defects include growth cracks and off-types only. Notes taken on other off-grades.

# Two replicates at this location, not included in calculation of LSD.

## Single plot at this location, not included in calculation of LSD.

Eastern States table 2. Total solids and chip color ratings, 1962.

Entry	New Tripoli, Pa.		Oxford, Pa.		Whately, Mass.	
	Total Solids	Chip color <u>1/</u>	Total Solids	Chip color <u>1/</u>	Total Solids	Chip color <u>2/</u>
		rating		rating		ratings
	Pct.		Pct.		Pct.	
Katahdin	17.1	5.7	18.5	1.2	17.4	2
Cobbler	17.4	-	19.8	1.0	17.5	2
Norland	13.9	-	16.5	1.8	14.9	1
Arenac	17.8	3.8	20.9	1.1	17.3	1
B69-16	16.8	-	19.6	1.4	18.3	3
Wy 1122	17.4	4.9	18.3	1.0	17.3	3
B3802-15	17.1	5.2	19.1	1.7	17.7	4
B3563-2	19.3	5.8	20.3	1.2	(19.0) <u>3/</u>	-
Fundy	16.8	-	-	-	17.2	3
Keswick	18.0	-	-	-	17.5	3
B3599-8	15.5	-	-	-	15.6	4
I 8140-1	20.1	4.6	21.2	1.0	-	-
156.51-2	-	-	21.9	1.4	(20.0) <u>4/</u>	1
Superior	-	-	19.8	1.0	-	-
Emmet	-	-	20.1	1.2	-	-
Plymouth	-	-	-	-	18.0	2
B4473-3	-	-	-	-	(16.8) <u>4/</u>	3
L. S. D. .05	.62		.80		NS	

1/ Wise Chip Color Key: 1-4 Acceptable; 5 Usable but not desirable;  
6-14 Unacceptable. (See notes)

2/ E. S. Chip Color Key: 1 Excellent; 2 Good; 3 Fair; 4 Poor. (See notes)

3/ Based on single plot, not included in calculation of LSD.

4/ Based on two replicates, not included in calculation of L. S. D.

MASSACHUSETTS  
Martin E. Weeks and David L. Field  
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Potato Variety Trials

Sixteen varieties of potatoes were tested in the 1962 season by the Massachusetts Agricultural Experiment Station. These varieties were tested mainly in cooperation with the National Potato Breeding Program of the Agricultural Research Service, U. S. D. A.

Trials consisted of 4 replications in rows 25 feet long randomized over an area of 3 blocks 10 rows wide and 150 feet long. Two replications only were used in the case of the B3696-13 and Superior varieties. The rows were spaced 36 inches apart in the row except in the case of the Russet varieties where the spacing was 16 inches. Blocks were spaced 12 feet apart and 2 guard rows of standard varieties were grown on each side of the blocks.

The planting date was May 7 and harvesting was on October 3. Vines were killed with  $\text{Na}_2\text{HASO}_3$ , a commercial preparation used at 1 gallon per acre rate on September 9.

The blocks on which potatoes were grown were strongly acid (4.8). The area was therefore limed at a 2-ton rate with magnesian lime (8%  $\text{MgO}$ ) to correct this condition and see if scab would be increased by the application. This apparently had no effect. Fertilizer was applied at the rate of 125-150-150 per acre at planting time. A 20-lb. application of borax was applied to certain rows in block 3 and appeared to have no effect. Diammonium phosphate also was used on certain rows with no measurable effect over regular fertilizer.

When the plants started to emerge they were sprayed once a week with Dieldrin. In early June, Parzate was added to the sprays. Dieldrin was cut out as the season advanced and Malathion was substituted. The latter part of July sprays were stepped up to twice a week. Rainfall during the season was 12.3 inches.

After harvest, the varieties were weighed and stored under canvas in an enclosed shed. They were graded and weighed according to size on October 18. About one week later the dry-matter content was determined and a sample of 5 tubers were made into potato chips according to a standard procedure.

Massachusetts table 1 shows average yield with L.S.D. values, size, dry matter content, relative quality and chip color for the different varieties.

Farm Tests

In 1962 cooperative tests were conducted on 2 farms as in several previous years. One of these in the Berkshire Hills area of Hampshire County and the other in the Connecticut Valley in Franklin County. Potatoes were grown and handled in the regular farm operations by the grower in fields of considerable acreages.

In the Berkshire Hills trial row spacing was 36" with about 6" spacing between seed pieces in the row. Planting date was May 18 and harvesting October 1. Fertilizer rate was 2500 lb. of 5-10-10-2 per acre in the row.



In the Connecticut Valley trial row spacing was 36" with 10"-spacing between seed pieces in the row. Planting was on May 9 and harvesting on October 1. Fertilizer used was 2000 pounds of 8-12-12-2.

These tests were conducted with the aid of Walter Melnick, Regional Extension Specialist, Pioneer Valley Extension Region. Cooperating growers were Mr. Ben Albert, Worthington, in Hampshire County and Mr. Charles Warner, Sunderland, in Franklin County. Both farms are in the Pioneer Valley Region.

Massachusetts table 1. Potato variety trials at Amherst, Massachusetts, 1962.

Variety	Yield per acre	Size B Tubers	Average Dry matter	Quality rank	Color Rating of chips
	Cwt.	Pct.	Pct.		
Green Mountain	411.3	3.6	21.9	1	
Kennebec	377.5	2.7	19.3	9	4.8
Chippewa	307.8	5.0	18.0	14	5.5
Onaway	264.6	3.2	18.8	12	7.5
Irish Cobbler	256.7	7.9	19.7	7	4.3
Avon	249.7	3.9	20.5	5	4.3
Kasota	236.7	10.2	18.5	15	7.0
Katahdin	227.3	2.8	19.1	10	5.0
Rushmore	220.4	2.3	19.4	8	3.8
Keswick	212.0	2.9	21.3	2	4.0
B3353-9	115.9	11.7	17.7	16	4.0
B3696-13*	172.8	5.1	21.1	3	
Superior*	439.2	2.5	18.9	11	4.5
Russet Burbank**	289.3	3.1	21.0	4	4.5
Russet Rural**	283.1	3.7	19.8	6	4.0
Russet Sebago**	195.7	2.5	18.8	13	
L.S.D. .05=58.1					

\*Measurements based on 2 instead of 4 replications.

\*\*16" spacings used for Russet varieties.

Massachusetts table 2. Yield in hundredweights per acre, dry matter and chip color ratings on 14 potato varieties grown in single plots on farms in Hampshire and Franklin Counties, 1962.

Hampshire County, (Berkshire Hills area)					Franklin County (Connecticut Valley)			
Variety	Ave. Yield	Size B Tubers	Chip color DM	rating	Ave. Yield	Size B Tubers	Chip color DM	rating
	Cwt.	Pct.	Pct.		Cwt.	Pct.	Pct.	
Green Mountain	346	8.7	20.2		567	8.1	20.7	
Kennebec	220	7.2	20.0	4	457	5.6	19.1	7
Russet Rural	209	18.3	20.7	6	349	7.7	19.7	4.5
Katahdin	248	4.7	19.9	4	335	5.5	17.1	5.5
Russet Sebago	216	19.2	20.9	3				
Keswick	193	12.4	21.9	9	267	6.1	18.1	5.5
Onaway	187	12.7	20.5	8	375	6.6	18.0	8
Avon	214	13.1	23.5	4				
Chippewa	168		18.9	4	364	14.2	17.4	7
Kasota					465	7.5	18.2	4.5
Rushmore					235	11.4	17.4	4.5
Russet Burbank					311	15.7	19.3	5
Irish Cobbler					271	9.7	19.2	7
B3359-9					236	12.8	16.7	4

C. E. Cunningham<sup>1/</sup>, <sup>MASSACHUSETTS</sup>  
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### Cooperative Testing of Potato Varieties for Use in Soups

Thirty-two varieties were grown in replicated yield tests at four locations in 1962. In addition, 114 seedling varieties were grown in 10-hill observation plots at each location. The locations and cooperators were as follows:

George Coombs, Shirley, New Jersey  
Donald Bernath Farms, Wauseon, Ohio  
John Braun, Racine, Wisconsin  
USDA, Presque Isle, Maine

Planting dates, harvest dates and cultural conditions were similar to those for other potatoes grown by each cooperator. At harvest, each plot was bagged separately and shipped to the Campbell Soup Laboratory, Riverton, New Jersey, by truck. The potatoes from each plot were graded and weighed. Specific gravity determinations were made and the potatoes from each plot were broken down into sub-samples under various conditions of controlled temperature and humidity. In addition, samples of approximately 400 varieties from USDA breeding stocks in Maine were placed under the same storage conditions.

Results of tests to evaluate the varieties for the softness and opaqueness of cooked dice after varying lengths of storage will be reported later.

Total yields and yields of tubers above 2 inches in diameter are presented in table 1. Several varieties were dropped from the analyses of the Ohio data because of poor plant stands caused by seedpiece decay.

Specific gravities of the different varieties grown at the different locations are given in table 2.

Eleven of the varieties in the 1962 yield tests will be included in the 1963 yield tests in addition to other varieties and selections which show promise.

Five of the 114 varieties in the 10-hill observation plots are to be included in the 1963 yield tests. Six varieties are being increased in Maine for larger scale plantings and tests. Fifteen varieties are being planted in 50-hill rows for further testing and possible inclusion in future yield tests. Thirty-seven varieties are being maintained in 20-hill rows. Fifty-one of the 114 varieties were discarded.

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<sup>1/</sup> Campbell Soup Company

<sup>2/</sup> USDA

Campbell table 1. Total yields and yields above 2 inches of potato varieties grown at 4 locations, 1962.

Variety	Location and Yields							
	Maine		New Jersey		Ohio		Wisconsin	
	Total cwt/A	Above 2" cwt/A	Total cwt/A	Above 2" cwt/A	Total cwt/A	Above 2" cwt/A	Total cwt/A	Above 2" cwt/A
Antigo	294	260	343	335	-	-	236	214
Blanca	357	318	359	296	382	350	297	257
Boone	454	431	422	402	299	280	297	285
Cherokee	390	359	292	260	336	325	245	223
Chippewa	379	343	405	378	385	367	258	233
Katahdin	387	358	395	370	412	397	277	265
Kennebec	418	397	395	376	435	421	320	306
Keswick	345	329	341	336	-	-	276	267
Menominee	397	377	407	388	286	173	303	285
Norland	292	265	267	237	281	271	158	127
Ona	398	351	362	334	282	262	331	316
Onaway	347	328	386	373	331	321	280	263
Ontario	422	386	535	482	340	318	317	285
Plymouth	376	359	309	294	287	284	244	218
Pungo	383	363	322	306	-	-	275	255
Red Pontiac	411	388	461	439	493	479	309	292
Saranac	422	388	437	350	321	268	364	341
Sebago	366	325	376	354	267	249	297	281
Teton	346	325	425	407	365	352	316	297
B605-10	343	324	382	362	235	227	216	182
B721-29	462	408	415	329	363	316	391	332
B2894-24	368	348	346	314	355	335	294	286
B3352-8	408	372	413	357	342	318	362	337
B3353-9	-	-	205	181	-	-	255	241
B3563-2	369	352	327	315	304	297	306	290
B3604-1	409	369	288	251	-	-	258	220
B3604-19	315	293	310	294	-	-	235	212
B3692-4	355	328	282	252	-	-	227	211
B3696-13	-	-	285	266	-	-	186	172
B3725-1	385	361	241	218	310	294	229	204
B4094-21	285	244	240	227	-	-	204	180
F4631	342	321	337	320	341	330	262	246
L.S.D. 5%	60	57	84	84	72	72	40	43
L.S.D. 1%	80	76	111	111	95	95	54	57



Campbell table 2. Specific gravity of potato varieties grown at 4 locations, 1962.

Variety	Location and Specific Gravity			
	Maine	New Jersey	Ohio	Wisconsin
Antigo	1.067	1.060	--	1.076
Blanca	1.072	1.071	1.072	1.084
Boone	1.071	1.067	1.063	1.078
Cherokee	1.072	1.067	1.075	1.083
Chippewa	1.064	1.059	1.059	1.071
Katahdin	1.075	1.065	1.070	1.077
Kennebec	1.077	1.068	1.070	1.089
Keswick	1.070	1.070	1.069	1.088
Menominee	1.072	1.071	1.067	1.080
Norland	1.064	1.051	1.061	1.066
Ona	1.074	1.074	1.064	1.088
Onaway	1.068	1.064	1.064	1.077
Ontario	1.069	1.073	1.064	1.083
Plymouth	1.072	1.059	1.066	1.081
Pungo	--	1.063	--	1.084
Red Pontiac	1.065	1.060	1.063	1.069
Saranac	1.074	1.079	1.067	1.078
Sebago	1.074	1.063	1.067	1.078
Teton	1.070	1.067	1.067	1.078
B605-10	1.062	1.068	1.068	1.075
B721-29	1.081	1.078	1.069	1.087
B2894-24	1.064	1.061	1.061	1.080
B3352-8	1.070	1.069	1.064	1.078
B3353-9	--	1.062	--	1.073
B3563-2	1.078	1.072	1.078	1.107
B3604-1	1.065	1.063	--	1.073
B3604-19	1.057	1.056	--	1.067
B3692-4	1.068	1.067	1.067	1.077
B3696-13	--	1.070	--	1.069
B3725-1	1.061	1.062	1.066	1.085
B4094-21	--	1.046	--	1.068
F4631	1.067	1.063	1.065	1.074
L. S. D. 5%	.006	.006	.005	.014
L. S. D. 1%	.008	.008	.007	.018

MINNESOTA

O. C. Turnquist, F. I. Lauer, A. W. Blomquist and C. J. Eide

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### Hybridization

Approximately 300 crosses were made during the past year in the greenhouse at St. Paul and the Potato Breeding Farm, Castle Danger. Continued emphasis was given to combination of factors controlling adaptation, external and internal tuber qualities, color, and disease resistance including common scab and late blight.

### Seedlings

Approximately 22,500 seedlings of 142 progenies were grown in the greenhouse, and 14,500 new seedlings were grown in the field at Crookston. Of the latter, about 850 were selected.

### Testing Program

Evaluations were made of the following materials: 550 inbred clones, 500 species hybrids, 500 test cross clones, 600 new selections, 450 semi-advanced selections, 37 advanced selections, and 17 selections and varieties. These were tested at one or more locations including Castle Danger, Duluth, Grand Rapids, Crookston, Grand Forks, St. Paul, Hollandale, Baker, Argyle, and Osseo. About 600 clones were included in tests for resistance to common scab at Grand Rapids, and 1,500 clones for resistance to late blight at Duluth. Also, at Grand Rapids, 53 varieties and selections were increased in an isolated tuber unit planting to provide basic seed stock for testing and distribution.

In addition, data were collected for three Ph.D. thesis studies. In one, effectiveness of inbred clones as parents was studied using 2000 clones grown at Grand Forks and Grand Rapids. In the other two, inheritance of resistance to common scab and of specific gravity was studied in a 13 x 13 diallel involving 7000 clones grown at Crookston and Grand Rapids.

### Advanced Selections

Adaptation trials consisting of 37 selections in addition to Norland, Cobbler and Red Pontiac were grown at Grand Forks, North Dakota and Hollandale. These were planted in 10-hill rows arranged in 2 complete randomized blocks. The total yield, specific gravity, maturity, tuber type, scab reaction and chipping quality is reported in Minnesota table 1. Maturity and tuber type are based on a scale of 1 to 5 with number 1 representing good type and earliness. Specific gravity is rated as follows: below 1.071, low (L); 1.071 - 1.080, medium (M); and above 1.081, high (H).

Potato chips were made from samples of each selection grown at Hollandale. Five tubers were cut in half and two slices 1/20 inch thick were taken from each half by means of a rotary food slicer. One hundred grams of slices were rinsed in cold water and placed on paper toweling to remove excess water. The slices were fried in corn oil at a temperature of 350° F. until bubbling ceased. The chips were again weighed for percentage of yield. Color ratings were made using a standard color chart prepared by the Potato Chip Institute International.

Minnesota table 1. Performance of Minnesota Selections grown at two locations in 1962.

Variety	Ave. Maturity Sept.3	Ave. Total Yield Lbs.	Ave. Specific Gravity	Chips * Color	Yield Pct.	Tuber Type	Scab Reaction	Tuber Color
Norland	2	25.6	L	6	26.9	2	Inter.	
101.44-4-44	4	17.2	M	4	27.9	3	Res.	
18.55-23-57	4	25.4	M	3	28.2	3	Res.	
199.54-31-56	4	36.3	H	4	29.4	3	Inter.	
75.56-6-58	5	32.2	H	3	30.3	4	Res.	
178.53-9-55	4	35.2	H	5	27.0	3	Sus.	
136.51-7-53	5	28.1	M	3	28.4	3	Res.	
26.56-11-58	4	31.4	M	10	20.8	2	Inter.	
53.54-7-57	5	39.3	H	5	27.5	2	Inter.	
24.57-12-59	5	18.7	M	6	27.1	3	Res.	Red
24.55-12-57	2	15.0	M	10	26.9	4	Inter.	
15.50-3-52	4	26.5	M	4	28.3	4	Sus.	
97.53-14-57	3	15.8	M	4	27.1	3	Res.	
47.54-20-56	4	34.2	M	8	26.8	3	Inter.	
32.52-13-57	5	32.0	H	3	28.3	3	Res.	
28.56-9-58	4	26.1	L	8	27.3	2	Res.	
4.56-5-58	4	33.1	M	5	32.3	2	Sus.	
Minn. 125	3	38.0	M	5	28.4	4	Inter.	
91.53-5-55	3	25.9	H	6	27.9	3	Res.	
11.57-13-59	2	35.0	H	5	28.2	2	Res.	Red
198.54-10-56	4	30.2	H	4	27.0	2	Res.	
54.54-2-56	2	24.0	M	7	25.8	3	Res.	
32.52-7-57	4	32.1	M	4	30.1	3	Res.	
Red Pontiac	5	48.0	M	6	27.5	2	Sus.	
18.55-19-57	4	27.3	L	9	27.3	3	Res.	
89.53-3-55	3	24.6	M	4	26.1	3	Res.	
53.54-19-57	5	26.8	H	8	26.8	3	Inter.	
46.56-10-58	5	27.5	M	4	27.8	4	Sus.	
172.51-8-53	3	22.6	M	2	27.6	4	Res.	
24.56-11-58	4	33.3	M	9	26.1	3	Inter.	
91.53-11-55	4	22.8	M	7	26.8	2	Res.	
T 46-1	3	32.6	H	5	26.5	3	Inter.	
28.55-19-57	2	33.2	M	6	27.3	3	Res.	
Cobbler	3	36.4	H	4	27.5	4	Sus.	
Minn. 20	4	22.6	H	5	28.0	2	Sus.	
53.54-20-57	2	27.4	M	5	30.3	3	Inter.	
34.55-25-57	4	10.6	M	5	28.7	3	Res.	
31.54-6-56	2	33.2	M	9	30.8	3	Res.	Red
7.56-1-58	4	21.2	H	12	29.4	3	Res.	
109.49-2-51	4	19.3	H	-	-	2	Res.	Red

\*Chipping test for Hollandale location only.

Potato variety demonstration plots were conducted at 5 locations in 1962. One hundred pounds of seed of each variety was planted in a double row with a commercial planter. Each plot is laid out in a complete randomized block design and replicated twice in a commercial potato field. At harvest the potatoes from a rod row within the double row of each variety were weighed and graded for size. Samples were taken for specific gravity and chipping tests. Results are reported in Tables 2, 3 and 4.



Table 2. Performance of potato varieties of 3 locations in the Red River Valley, 1962.

Variety	Baker, Minn. (1)				Argyle, Minn. (2)				Grand Forks, N.D. (3)				Average			
	Total		U.S.		Total		U.S.		Total		U.S.		Total		U.S.	
	Yield	Spec.	Size*	Gravity	Yield	Spec.	Size*	Gravity	Yield	Spec.	Size*	Gravity	Yield	Spec.	Size*	Gravity
	/acre*				/acre*				/acre*				/acre			
	Cwt.	Pct.			Cwt.	Pct.			Cwt.	Pct.			Cwt.	Pct.		
Bounty	214	88	1.083		304	92	1.081		250	92	1.092		256	91	1.085	
Red LaSoda	192	61	1.082		309	95	1.082		215	93	1.084		239	83	1.082	
F-29	182	87	1.082		299	94	1.085		228	92	1.088		236	91	1.085	
Red Pontiac	174	69	1.083		305	94	1.078		226	92	1.085		235	85	1.082	
LaRouge	165	91	1.081		277	93	1.078		210	91	1.090		217	92	1.083	
Irish Cobbler	161	86	1.091		311	93	1.106		175	85	1.093		216	88	1.096	
Minn. 125	156	91	1.082		274	95	1.076		172	91	1.088		201	92	1.082	
Kennebec	158	89	1.088		260	92	1.083		180	90	1.087		199	90	1.086	
Norland	163	83	1.079		215	91	1.089		189	89	1.088		189	88	1.089	
T 461-1	186	85	1.081		207	91	1.083		172	88	1.084		188	88	1.083	
Red Warba	183	90	1.087		-	-	-		-	-	-		183**	90	1.087	
Minn. 355	177	92	1.090		214	96	1.090		151	88	1.100		181	92	1.093	
Snowflake	159	84	1.080		224	93	1.083		157	86	1.090		180	88	1.085	
Cherokee	128	86	1.088		232	95	1.087		159	88	1.092		173	90	1.089	
Minn. 20	145	63	1.089		239	96	1.100		133	88	1.097		172	82	1.095	
P 6719-4	-	-	-		167	83	1.083		-	-	-		167**	83	1.083	
ND 4192-3	125	74	1.082		160	82	1.083		144	78	1.087		143	78	1.084	
Early Ohio	124	68	1.096		-	-	-		-	-	-		124**	68	1.096	
Erli Red	-	-	-		118	90	1.079		119	80	1.090		118***	85	1.084	
Average	164	82	1.085		242	92	1.085		180	83	1.090		190	87	1.087	

\* Mean of two replications

\*\* Mean of one location only

\*\*\* Mean of two locations only

(1) Cooperator: Lincoln Thompson

(2) Cooperator: Leonard Hapka

(3) Cooperator: Red River Valley Potato Growers Ass'n.

Planted: June 1

Planted: May 5

Planted: June 7

Harvested: September 20

Harvested: September 18

Harvested: September 6 and 19

Minnesota table 3. Performance of potato varieties at Osseo, Minnesota, 1962.

Variety	Total Yield /acre Cwt.	U.S. No.1 Size Pct.	Specific Gravity
Bounty	338	91	1.071
Red LaSoda	338	95	1.068
Kennebec	362	96	1.084
LaRouge	335	94	1.071
Red Pontiac	324	97	1.070
Minn. 355	323	97	1.083
T 461-1	317	92	1.089
Norland	300	94	1.067
Cherokee	258	90	1.080
Snowflake	256	86	1.060
F-29	253	94	1.070
Irish Cobbler	235	97	1.077
Minn. 125	214	92	1.061
Russet Burbank	203	77	1.088
Minn. 20	186	95	1.073
ND 4192-3	166	80	1.077
Early Gem	143	93	1.059
Average	268	92	1.073

Cooperator: Wingard Bros.

Planted: May 1

Harvested: October 2

Minnesota table 4. Performance of potato varieties at Hollandale, Minnesota, 1962.

Variety	Total Yield /acre Cwt.	U.S. No.1 Size Pct.	Specific Gravity
Minn. 355	336	94	1.075
Kennebec	330	97	1.061
Bounty	321	95	1.064
LaRouge	313	91	1.055
Cherokee	299	95	1.063
T 461-1	296	93	1.062
Red Pontiac	295	93	1.051
Red LaSoda	294	96	1.060
Erli Red	286	91	1.059
F-29	283	94	1.060
Snowflake	282	91	1.055
Irish Cobbler	281	91	1.063
Minn. 125	267	96	1.055
Norland	188	83	1.055
Minn. 20	172	90	1.060
ND 4192-3	125	84	1.052
Average	273	92	1.059

Cooperator: Southern Minn. Veg. Growers Ass'n. & Herb Brand & Son

Planted: May 29

Harvested: October 22

MISSISSIPPI  
W. S. Anderson  
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The tests this year included comparisons of seven named varieties and four numbered seedling selections, some with sufficient seed for seven randomized blocks and some with enough for only three. There were also included 42 seedlings in small lots for observation. All of the numbered selections were from the breeding program of Dr. T. P. Dykstra, U. S. Department of Agriculture and these were observed by him at harvest. All seed in the replicated yield plots were northern grown. That of Dazoc, Bounty, Redkote, Red LaSoda, and Triumph came from Nebraska and were furnished by the Nebraska Station at Alliance. That of Norland was grown in North Dakota.

The plots, one row 25 feet long and 42 inches wide, were located on Kaufman fine sandy loam soil which was well prepared before planting by plowing and harrowing. Beds were formed on March 15 with tractor operated disk hillers and 8-8-8 fertilizer was simultaneously applied in the two sides of the ridge at 2000 pounds per acre. The pre-cut seed pieces we planted 12 inches apart on March 16. Practically perfect stands were obtained, weeds and insects were kept under control by cultivation for the former and Dieldrin spraying for the latter. No diseases were observed. Growing conditions were favorable except during late May and June when the temperature became too hot for best performance. In order to provide ample soil moisture 5 irrigations of approximately one inch each were given. Harvest was accomplished on June 21 when the tubers were separated into U. S. No. 1 size and "Others" and the yield of each plot weighed. The specific gravity of each variety was checked on the same day with the National Potato Council hydrometer. Readings could not be obtained for any variety because every sample floated above the scale on the instrument. Within a week after harvest a sample of each variety was "chipped" and cooked under standard conditions. These chips were examined and "placed" according to their rank in color and flavor one month later. The data are shown in Mississippi table 1.

Outstanding in this test was the seedling 6896 with a high yield of well shaped tubers with good surface and skin color and the best chips. It is early enough in maturity to meet the needs of southern growers. It far exceeded in several respects the named varieties from Nebraska, Redkote, Bounty and Dazoc.



Mississippi table 1. Summary data from Irish potato variety trials, Mississippi State University, 1962.

Variety	Yield per acre calculated				Chip ranking	
	U.S. No.1		Others		Color	Flavor
	3 blocks	7 blocks	3 blocks	7 blocks		
	cwt.	cwt.	cwt.	cwt.		
Norland	73.7	76.2	32.4	27.4	8*/	10
Red LaSoda	48.8	46.3	28.9	24.4	3	2
Triumph	33.4	40.8	30.9	32.4	6	6
Dazoc	39.3	49.3	35.4	27.4	4	5
Redkote	57.8	66.2	39.3	37.3	8*/	12
Bounty	59.3	64.7	61.2	59.3	5	7
Catoosa <sup>1/</sup>	46.3		34.8		7	9
6875	75.2		22.4		3	8
6937	29.4		32.4		8*/	11
6894	57.3		37.8		2	3
6896	96.1		29.4		1	1
L.S.D.	31.0					

<sup>1/</sup> Two blocks only.

\*/ Too dark to be acceptable.

NEBRASKA

R. B. O'Keefe and David S. Nuland

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I. Development of new varieties with superior yield, disease resistance and quality:

A. Hybridization and seedling production:

A total of 31 parental clones were used in 728 crosses in 1962. Two methods of producing true seed were employed, i.e., pollination of flowers on plants grown in ground beds in the greenhouse and pollination of flowers on "cut" stems placed in water with controlled temperature (65° F.) and light (16 hours of 700 f.c.). The number of successful pollinations was 2.5 times greater using the "cut" flower method, but the average weight of seed balls and seeds and number of seeds per seed ball was greater with the ground bed method Nebraska table 1.

The crosses included a diallel set from 12 parents for the purpose of progeny tests for general and specific combining ability for scab resistance and yield (See III) as well as the identification of superior selections. Eight parental clones were used in a diallel set of crosses to determine general and specific combining ability for specific gravity.

B. Field screening:

A total of 564 clones were screened for yield, grade quality and scab reaction under dryland conditions at the Box Butte Experiment Station. Two-hundred and forty-six of the clones were included in a comparable irrigated plot. Ninety-eight clones were planted in two replicates of 5-hills at two locations under irrigation and evaluated for scab reaction and yield. Eight clones were identified as possessing a high degree of scab resistance (type 3 or less) combined with high yielding ability Nebraska table 9.

C. Greenhouse screening of advanced clones for reactions to Fusarium and Verticillium wilts:

A total of 60 clones and varieties of which 29 were repeats from the 1961 tests were screened for reactions to Fusarium and Verticillium wilts using the "tooth-pick" inoculation method. One stem of each of five plants was inoculated with Fusarium eumartii and another stem with Verticillium albo-atrum. A third stem provided a "check" plant. Disease readings were made 68 days after inoculation and indices of infection were calculated as shown in Nebraska tables 2 and 3.

Of the repeat selections, 28.51-4, 45.51-3, 181.51-2, 89.55-1, and 186.55-3 exhibited tolerance or resistance to both organisms. Resistant or tolerant selections tested for the first time were Progress, 226.49-1x, 29.55-1, 93.55-16, 247.55-2, 4.56-9, 25.56-1, 94.56-2x, and 99.56-3x.

## II. Development of varieties suitable for chipping and processing:

During the past four years a total of 1096 clones have been screened for chipping quality following 5 to 6 months cold storage and reconstitution. Established deep fat frying methods (350° F., two to five minutes) were followed. The clones were evaluated for chip color (Rd), oil absorption, dry matter content and chip yield. Three hundred and forty-nine, 266, 174, and 307 clones were chipped for 1959, 1960, 1961, and 1962 respectively. A total of 141 selections exhibited good to excellent reconstitution and chipping quality. Seventy-one of these have been retained in the program. Twelve clones were two year repeats. Three clones were three year repeats (Nebraska table 4). Forty-seven selections represent the top 15% of the 1962 reconstituted clones (Nebraska table 5). Of these, 14 clones exhibited superior reconstitution and chipping quality; the remaining clones were acceptable to good.

Seven named varieties and nine advanced selections were screened for yield, grade, and chipping quality at Dutch Flats and Mirage Flats in western Nebraska in 1961 (Nebraska table 6). The data for the 1962 trials with 21 selections in western Nebraska were not completed at the time of this report. Four named varieties and advanced selections were evaluated at Red Cloud, McCook, and Hastings in 1962 (Nebraska table 7). Twenty named varieties and advanced selections were screened in a trial at Gibbon in 1962 (Nebraska table 8).

On all of these trials, the following selections produced acceptable to good yields and chipping quality: Haig, Kennebec, Blanca, 156.51-2, 302.50-5, 38.53-20, 4.56-9, 201.55-3, and 396.55-21.

Seed stocks of the advanced selections 156.51-2 and 302.50-5 are being increased for potential release to commercial growers in 1964 for the production of processing potatoes. Seedling 315.48-3X was named and released as the variety Pioneer in 1962 and is being utilized for the production of frozen french fries.

## III. Breeding potato parental lines for resistance to scab, heat, and drouth (contributing to Regional Project NCR-34, Potato Genetics):

Genetic and environmental components of variance for the inheritance of scab resistance and yield were investigated further using 98 clones, 2 replicates, and 2 locations with irrigation. Heritability estimates on a clonal mean basis were 0.69 and 0.42 for scab type and yield respectively, and include additive dominance and epistatic effects. On the basis of a single location, the comparable estimates were 0.36 and 0.18 which were in general agreement with previously obtained estimates at one location. The variance due to locations was highly significant for both characters, and the genotype-location interaction was highly significant for yield (Nebraska table 9). Twenty-two of the clones had been included at one location for 3 years. The genotype-year interaction was highly significant for scab type. The effect due to replications was not significant. These results suggest that superior genotypes may be identified under field conditions by testing in 2 replicates of 5-hills, at 2 locations for 2 years. The procedure may be extended for use in progeny testing for the identification of parental clone genotypes by including 5 or 10 individuals per test cross per plot per replicate with selection based on family means for 100 or 50 test crosses.



Estimates of heritability and general and specific combining ability of parental clones are being obtained for heat and heat-induced drouth resistance and related plant characters. The genetic parameters are being estimated from heat machine test data and analysis of variance procedures.

Polyhaploid families from the IR-1 station are being screened for scab reaction and horticultural characteristics. Desirable individuals will be incorporated into the genetic and breeding program. Genetic improvement will be compared at the tetraploid and diploid levels.

#### IV. Potato variety trials:

##### A. Early crop areas of central Nebraska:

A total of 7 varieties and 17 advanced selections were included in replicated yield trials at 4 locations as given in Nebraska tables 10 and 11. The trials were planted in early April and harvested in mid-August. Temperatures were generally below normal throughout the season. Rainfall was above normal and late season rains delayed harvesting and reduced specific gravity as determined by periodic harvests in commercial fields. Highest total yields and yields of U. S. No. 1 potatoes were produced by Bounty, Dazoc, Blanca, 27.55-2, 396.55-1, 83.55-8, 4.56-8, and 77.57-1. Highest specific gravities (hydrometer method) were recorded for Bounty, Blanca, Haig, 156.51-2, and 114.51-2.

##### B. Late crop areas of western Nebraska:

Four varieties and 16 advanced selections were included in replicated trials with irrigation in western Nebraska (Nebraska table 12). The trials were planted in late June and harvested in early October. Temperatures were generally below normal. Rainfall was above normal and delayed planting in June. An early freeze (24° F.) on September 8 terminated growth of the plants in the Mirage Flats plot.

Highest yields were produced by Blanca, 156.51-2, 201.55-3, 396.55-1, 114.51-2, 156.52-2, 77.57-1, and 83.55-8. Highest specific gravities were recorded with 156.51-2, Blanca, Pioneer, 396.55-21, 27.55-2, and 114.51-2.

Nebraska table 1. The percentage of flowers fertilized and crosses completed for 2 methods of producing true potato seed.

M E T H O D S						
Factor	Ground Bed			Water Culture		
	Misc. Crosses	12 Scab Parent Crosses	Total	Misc. Crosses	12 Scab Parent Crosses	Total
Number of crosses made	26	36	62	87	98	185
Number of flowers fertilized	42	72	114	150	160	310
Number of crosses attempted	94	199	293	189	146	335
Number of flowers used	154	465	619	436	245	681
Percent of crosses completed	28	18	21	46	67	55
Percent of flowers fertilized	27	15	18	34	65	46
Ave. wt. of fruit (gms.)	--	--	5.60	--	--	4.30
Wt. of seeds per fruit	--	--	0.09	--	--	0.04
Ave. No. seed per fruit	--	--	160	--	--	84

Nebraska table 2. Reaction of named varieties and potato selections during 1961 and 1962 greenhouse tests to toothpick inoculation with Fusarium and verticillium wilts.

Infection Index 2/

Selection 1/	Fusarium			Verticillium		
	Year difference 3/	Variety Average	Variety Rank	Year difference 3/	Variety Average	Variety Rank
Redbake	-42	78	21	-50	55	15
Dazoc	- 2	61	9	0	68	18
Haig	+24	88	27	0	94	29
Red Beauty	+12	68	16	-38	19	2
Kennebec	- 1	43	4	+30	75	24
Red Pontiac	-16	68	16	+36	72	21
Pioneer	+38	67	13	0	84	26
38.49-6	-24	72	18	+ 6	45	12
76.50-4	-34	77	20	-38	61	16
302.50-5	+20	78	21	+38	74	23
28.51-4	- 6	41	3	+ 1	26	4
45.51-3	-24	12	1	- 4	28	5
114.51-2	-58	67	13	+25	38	8
156.51-2	- 8	62	10	-44	70	19
164.51-2	-20	90	28	-44	22	3
181.51-2	-68	56	7	+32	28	5
27.55-2	-42	55	6	-42	47	13
83.55-8	+30	63	11	+53	70	19

continued

Nebraska table 2, continued.

89.55-1	+14	67	13	+25	28	5
186.55-3	-92	46	5	-25	43	10
193.55-1	+12	86	25	-26	13	1
396.55-1	- 6	73	19	-40	80	25
396.55-3	-70	35	2	-16	66	17
396.55-21	+ 4	36	25	56	72	21
398.55-2	- 2	81	23	+19	43	10
124.56-5	+78	57	8	-12	86	28
135.56-3	-20	90	28	+34	83	26
104.57-1	-18	83	24	+28	38	8
202.57-2	+ 6	63	11	+10	53	14
$\bar{x}$	- 8	66		+ 3	54	
L.S.D. .05	52	14		45	12	
C. V.		38.76%			40.72%	
$\bar{x} \pm s \bar{x}$	1961 = 62 $\pm$ 29		1961 = 56 $\pm$ 31			
	1962 = 70 $\pm$ 21		1962 = 53 $\pm$ 24			

1/ Red Beauty = resistant, Kennebec = susceptible Verticillium checks; Red Pontiac = tolerant, Redbake = susceptible Fusarium checks.

2/ Based on 5 three-stem plants the infection index = the number of plants infected x 10 + severity (1 to 5) x 2; 0 = resistant, 60 = tolerant, 100 = completely susceptible.

3/ The difference between infection index value for 1961 minus infection index value for 1962 = year difference.

Nebraska table 3. Reaction of additional named varieties and potato selections to toothpick inoculation with Fusarium and Verticillium wilts in the greenhouse in 1962.

Selection 1/	Infection Index 2/		Parents	
	Fusarium	Verticillium	Female	Male
Red Beauty	62	38	--	--
Kennebec	36	60	--	--
Red Pontiac	76	54	--	--
Redbake	58	80	--	--
Progress	54	42	Jubel	Minn 26-6-1-1-2
White Cloud	78	77	Warba	Katahdin
B926-9	66	58	B66-1	B792-94
90.49-1x	88	50	204.43-1	Minn. 43
226.49-1x	54	26	Arnica	Yampa
379.51-B16	90	96	B929-32	Minn 101.44-4-46
39.52-1	80	54	B522-33	Minn 73.43-44-45
156.52-2	82	38	302.48-1x	120.50-2
38.53-20	66	--	Haig	Haig
9.55-1	46	90	45.47-7x	25.47-7x
29.55-1	60	38	Redbake	45.47-5x
78.55-2	90	40	302.48-1x	93.48-1
81.55-1	96	32	72.49-1x	93.48-1

continued



Nebraska table 3, continued.

85.55-1	72	58	45.51-1	93.48-1
93.55-16	38	40	45.47-5x	Haig
95.55-0	48	98	229.47-1	Haig
178.55-1	84	33	77.44-1	131.50-2
247.55-2	12	62	226.49-1x	45.51-3
396.55.29	100	50	Redbake	ND 2906-1R
398.55-10	80	80	93.48-1	ND 2906-1R
412.55-2	42	14	Redbake	107.52-13
4.56-9	58	40	Redbake	29.47-2
25.56-1	46	40	Excel	91.48-3
94.56-2x	36	36	114.51-2	164.51-2
92.56-1	77	--	212.50-2	114.51-2
99.56-3x	12	24	104.52-2	114.51-2
183.56-7	64	68	B1859	93.48-1
40.57-3	90	30	Bounty	156.52-2
50.57-3	82	0	ND 2853-3R	156.52-2
77.57-1	78	56	45.51-3	378.48-2x
97.57-2	68	66	Haig	84.51-1
$\bar{x} \pm s \bar{x}$	65 $\pm$ 22	51 $\pm$ 23	-----	-----

1/ Red Beauty = resistant, Kennebec = susceptible Verticillium checks;  
Red Pontiac = tolerant, Redbake = susceptible Fusarium checks.

2/ Based on 5 three-stem plants the infection index = the number of plants infected x 10 + severity (1 to 5) x 2; 0 = resistant, 60 = tolerant, 100 = completely susceptible.

Nebraska table 4. Chipping quality of 15 clones with chip color among top 15% for 2 or more of the past 4 years reconstitution of selected material.

Selection	Chip <sup>1/</sup>	2/	Dry <sup>2/</sup>	Chip yield <sup>3/</sup>	Parents	
	color	Oil	Matter	Per Hundred	Female	Male
		Pct.	Pct.	Pounds		
In top 15 percent in 2 years						
186.55-3	31.7 4a/	43.9	20.6	35.0	72.49-1	131.50-2
396.55-3	33.4	34.8	22.2	34.0	Redbake	ND 2906-1R
396.55-20	32.9	38.8	19.6	31.8	"	"
396.55-28	35.0	37.8	21.8	35.0	"	"
10.56-2	34.0	37.1	21.4	34.0	83.49-1	27.47-2
83.56-1	29.6	36.8	22.4	35.4	29.47-2	114.51-1
96.56-1	33.3	42.3	18.8	32.7	222.51-9	114.51-2
150.56-2	26.3	40.2	19.0	36.6	215.50-2	53.52-1
106.57-1	27.4	44.4	20.4	36.8	I-801-10	84.51-1
136.57-2	31.6	41.1	19.7	33.6	77.51-2	90.49-1x
185.57-1	26.1	49.4	18.9	36.8	27.55-1	18.53-2
213.57-1	34.0	42.6	21.6	37.3	85.55-2	83.44-3

continued

Nebraska table 4, continued.

In top 15 percent in 3 years						
96.56-2	30.4 <sup>4b/</sup>	43.1	19.0	34.2	222.51-9	114.51-2
137.57-3	29.7	40.5	21.8	36.7	84.51-1	90.49-1X
202.57-1	29.7	43.6	19.3	33.9	90.49-1X	240.54-1
Check						
Haig	17.8 <sup>4c/</sup>	40.1	19.6	32.7	Cayuga	Minn 43
<u>1/</u> Rd based on white standard No. D 25-427 and taken with Hunter Color Difference meter.						
<u>2/</u> Oil extracted from 10 gms. chips in 75 ml. toluene; converted percent dry matter in chips to 100 pounds of fresh potatoes.						
<u>3/</u> Pounds per 100 pounds of fresh potatoes.						
<u>4/</u> a. Average values for 2 years.						
b. Average values for 3 years.						
c. Average values for 4 years.						

Nebraska table 5. Chip quality of potato selections ranked on chip color following 5-month storage at 38° F. and 3 weeks reconstitution at 70° F., 1962.

Selection	Chip	Oil <u>2/</u>	Dry	Chip	Parents	
	Color <u>1/</u>		Matter <u>2/</u>	Yield <u>3/</u>	Female	Male
		Pct.	Pct.			
99.56-4X	28.4	46.7	19.3	36.4		
213.57-1	27.1	51.2	19.1	38.2	85.55-2	83.44-3
96.56-4	25.3	45.9	19.6	36.4	222.51-9	114.51-2
9.53-3	24.3	43.7	22.0	39.1	95.48-1	140.47-1
77.51-2	24.3	45.8	20.2	37.2	82.47-5X	Self
137.57-3	24.0	45.0	21.5	39.1	84.51-1	90.49-1X
156.51-2	24.0	40.6	22.7	38.2	86.48-1	Self
93.55-16	23.0	46.5	19.4	36.4	45-47-5X	Haig
112.59-1	22.4	49.0	19.5	37.3	91.57-H33	91.57-H31
99.56-5X	21.5	47.4	22.4	42.7	104.52-2	114.51-2
76.50-4	21.5	--	--	36.4	15.40-2	83.48-3
205.55-2	21.4	49.9	17.3	34.5	ND2774-32	131.50-2
ND-3324-2	21.2	44.8	19.0	34.5	--	--
221.57-3	21.0	58.6	15.9	37.3	83.55-3	85.55-2
106.57-1	20.8	48.2	18.8	36.4	I-801-10	84.51-1
250.57-1	20.7	52.3	19.1	39.1	156-52-2	Wisc.13752
95.58-1	20.6	50.2	18.1	36.4	9.53-5	98.53-1
Minn 12.45-2	20.5	46.5	19.9	37.5	--	--
133.53-1	20.2	48.4	20.6	40.0	155.49-1X	144.49-14
PI 188622	19.9	50.5	17.5	35.5	--	--
24.59-2	19.8	46.5	20.5	32.3	107.57-H15	93.48-1-1
202.57-1	19.7	47.3	19.7	36.4	90.49-1X	240.54-1
160.56-1	19.7	50.6	17.5	35.5	215.50-2	114.57-2
96.56-2	19.7	42.5	18.5	35.5	222.51-9	114.51-2
178.55-1	19.6	51.8	15.7	32.7	77.44-1	131.50-2
47.59-2	19.5	55.8	17.3	39.2	143.50-2	Self
224.51-1	19.5	47.0	20.2	38.2	254.48-1	368.48-1

continued

Nebraska table 5, continued.

Wisc. 143-52	19.3	52.0	18.3	38.2		
B 3008-1D	19.1	48.2	17.4	33.6	B395-5	B962-32
ND 2853-3R	19.0	49.6	16.9	33.6	Cayuga	ND1021-1
83.56-1	19.0	46.7	18.4	34.5	29.47-2	114.51-1
18.58-1	18.6	49.5	17.0	33.6	114.49-1X	104.52-2
Wis - 1	18.3	48.9	19.9	39.1	Wisc.125	D27.50-1
16.55-1	18.1	50.5	17.5	35.5	226-49-1X	25.47-7X
222.51-9	18.0	47.9	19.4	37.2	86.48-1	368.48-1
71.57-2	17.9	53.7	18.5	40.9	Wisc.143-52	164.51-2
93.53-1	17.9	46.5	21.9	40.9	Minn 113.43-8	41.49-3
176.50-3	17.9	51.2	16.4	33.6	385.48-4	311.43-1
9.55-1	17.7	51.8	17.9	37.2	45.47-7X	25.47-7X
379.51-B16	17.7	45.1	20.9	38.1	B929-32	Minn 101.44-4
125.59-1	17.5	53.5	12.7	38.2	107.57-H15	107.57-H37
35.59-1	17.5	49.7	19.6	37.3	72.57-1	Self
150.56-2	17.5	48.5	18.2	35.5	215-50-2	53.52-1
9.53-B7	17.5	48.0	19.8	38.1	95.48-1	140.47-1
51.58-1	17.3	52.8	16.3	34.5	20.44-2	140.47-1
140.47-1	17.3	50.9	16.5	33.6	117.43-3	Self
$\bar{x}$	20.2	48.9	18.9	36.8		
$s\bar{x}$	+2.6	+3.3	+1.7	+2.2		
Checks:						
Pioneer	21.6	44.3	19.7	35.5	225.43-1	Minn 113.43-1
Haig	14.7	47.2	18.7	35.5	Cayuga	Minn 43

1/ Rd based on white standard No. D 25-427 and taken with Hunter Color Difference meter.

2/ Oil extracted from 10 gms. chips in 75 ml. toluene; converted percent dry matter in chips to 100 pounds at fresh potatoes.

3/ Pounds per 100 pounds of fresh potatoes.

Nebraska table 6. Chip yield and quality of potatoes (stored at 40° F. and re-constituted at 70° for 3 weeks) ranked on chip color and produced with irrigation in western Nebraska 1961.

Selection	Chip color 1/		Percent Oil 2/		Pct. Dry Matter2/		Chip Yld.#/100 3/	
	Mirage Flats (Sheridan Co.)							
	4/	Mean	4/	Mean	4/	Mean	4/	Mean
396.55-21	-7.4	25.1	+9.5	38.0	-2.2	18.3	+0.9	29.6
Navajo	-0.3	24.3	+16.6	43.6	-5.9	17.7	-0.9	31.4
299.53-B	-5.7	22.9	+ 8.2	39.6	-0.1	17.0	+3.6	28.2
27.55-2	-13.2	22.0	+ 5.6	40.5	-1.8	18.4	0.0	30.9
Norland	+3.3	21.6	+ 3.4	37.2	-0.5	18.6	+0.9	29.6
156.51-2	-4.1	21.1	+ 5.5	38.2	-2.2	18.3	-1.7	30.0
396.55-1	-3.1	20.9	+ 0.4	42.8	+0.4	16.9	+0.9	29.6
302.50-5	-0.1	20.8	+ 6.7	40.0	-1.9	17.5	0.0	29.0
LaRouge	-5.5	20.6	+ 4.0	40.5	0.0	16.2	+1.8	27.3
201.55-3	-8.1	20.2	+ 8.8	40.4	-0.9	17.1	+2.7	28.7
Bounty	+0.2	19.8	+ 7.9	41.0	-2.5	18.3	0.0	30.9
Pioneer	+2.0	19.5	+ 4.0	41.4	+0.5	16.8	+2.7	28.7

continued



Nebraska table 6, continued.

Blanca	-3.1	19.3	+4.2	39.8	-1.8	17.8	-0.9	29.6
Haig	-4.5	18.2	+8.0	39.5	-1.3	18.2	-1.8	30.0
186.55-3	-4.2	17.8	+6.2	39.8	-1.3	17.8	-0.9	29.6
38.49-6	-3.6	15.1	-5.4	35.5	-1.3	16.8	0.0	28.2
$\bar{x}$	-3.5	20.5	+5.9	39.9	-1.4	17.6	-0.8	29.4
L.S.D. .05	2.2	6.2	2.5	7.0	0.8	2.3	.7	2.1
.01	3.0	8.6	3.4	9.7	1.1	3.2	1.0	3.0
Dutch Flats (Sioux Co.)								
299.53-B <sub>1</sub>	-2.7	34.0	+1.2	36.5	-0.4	20.8	0.0	32.7
156.51-2	-2.3	32.1	+0.9	39.3	+0.5	22.9	+1.3	37.8
302.50-5	-9.0	30.6	+1.3	36.4	-1.4	21.8	-1.4	34.1
201.55-3	-13.1	27.9	+7.3	39.4	-2.4	19.3	0.0	31.8
LaRouge	-5.2	26.9	-0.1	41.0	-0.3	19.6	-0.5	33.2
396.55-1	-8.0	25.8	-2.3	36.8	+0.4	21.0	-0.5	33.2
186.55-3	-4.7	24.8	+4.6	35.4	-0.6	20.8	+1.3	32.3
Blanca	-4.6	24.7	+2.2	40.7	0.0	19.7	+1.3	33.2
396.55-21	-3.2	24.4	+2.7	38.0	-0.8	19.7	+0.9	31.8
Bounty	-3.4	24.3	+4.9	40.4	-1.7	20.1	0.0	33.6
Pioneer	+3.0	23.8	+0.2	43.3	-0.4	19.4	-0.5	34.1
Haig	+0.3	21.3	+3.4	38.8	-1.5	20.9	-0.5	34.1
27.55-2	-5.1	21.1	+4.1	36.7	-1.1	20.5	+0.4	32.3
38.49-6	-2.1	20.6	+3.9	38.7	-1.0	18.7	+0.4	30.5
Navajo	-2.1	19.9	+2.2	35.4	-0.2	20.0	+0.9	30.9
Norland	-3.5	19.8	+3.3	41.5	-1.2	17.8	-0.5	30.5
$\bar{x}$	-8.2	25.1	+5.0	38.6	-1.4	20.2	+0.3	32.9
L.S.D. .05	4.0	11.3	2.5	6.9	0.8	2.4	0.9	2.5
.01	5.5	15.7	3.4	9.6	1.2	3.3	1.2	3.4

Combined Analysis

Anteractions      Loc X Treatment\*      None      None      Var X Loc\*

1/ Rd based on 100 percent pure white standard and taken with Spectronic "20".

2/ Oil extracted from 10 gms. chips in 75 ml. toluene; converted percent dry matter in chips to 100 pounds of fresh potatoes.

3/ Pounds per 100 pounds of fresh potatoes.

4/ Treatment difference values = chilled minus reconstituted chip values.

Nebraska table 7. Chip yield and quality of potato varieties and selections (Non-chilled). Ranked on chip color and grown in South Central Nebraska for processing purposes, 1962.

Selection	Chip Color <u>1/</u>	Oil <u>2/</u>	Dry Matter <u>2/</u>	Chip Yield Per Hundred <u>3/</u>
		Pct.	Pct.	Pounds
Hastings (Adams Co.)				
156.51-2	25.1	71.1	19.2	40.9
Dazoc	23.8	60.2	17.1	32.8
Blanca	23.7	72.8	16.5	34.5
Kennebec	21.0	69.9	16.7	35.5
Haig	20.1	72.7	17.8	36.4
Bounty	19.5	68.2	18.6	33.6
302.50-5	18.0	74.1	16.2	35.5
Pioneer	17.4	69.9	17.5	34.5
$\bar{x} \pm s \bar{x}$	21.1 $\pm$ 4.8	69.9 $\pm$ 4.1	10.6 $\pm$ 1.2	35.5 $\pm$ 2.3
McCook (Red Willow Co.)				
302.50-5	28.5	60.8	19.0	34.5
Pioneer	23.6	61.0	19.3	34.5
Dazoc	23.4	67.0	18.8	35.5
Haig	22.0	65.6	19.7	39.1
Blanca	21.7	62.7	20.7	36.4
156.51-2	20.7	58.9	22.7	39.1
Bounty	17.3	62.5	18.8	35.5
Kennebec	16.3	65.6	19.2	38.2
$\bar{x} \pm s \bar{x}$	21.7 $\pm$ 3.6	63.0 $\pm$ 2.6	13.5 $\pm$ 1.1	36.6 $\pm$ 1.8
Red Cloud (Webster Co.)				
Bounty	34.6	50.6	19.5	31.8
156.51-2	34.0	51.1	22.7	32.7
Kennebec	33.0	48.3	19.0	33.6
Blanca	32.7	54.8	20.1	32.7
Dazoc	31.6	52.8	17.5	29.1
302.50-5	28.5	52.3	18.6	39.1
Haig	27.4	45.8	18.2	28.2
Pioneer	17.8	53.9	18.0	30.0
$\bar{x} \pm s \bar{x}$	30.0 $\pm$ 5.2	51.2 $\pm$ 2.9	15.7 $\pm$ 1.6	32.2 $\pm$ 3.2

1/ Rd based on white standard No. D 25-427 and taken with Hunter Color Difference meter.

2/ Oil extracted from 10 gms. chips in 75 ml. toluene; converted percent dry matter in chips to 100 pounds at fresh potatoes.

3/ Pounds per 100 pounds of fresh potatoes.

Nebraska table 8. Chip yield and quality of potato varieties and selections (non-chilled). Ranked on chip color and grown in Central Nebraska, 1962.

Selection	Chip Color <u>1/</u>	Oil <u>2/</u> Pct.	Dry Matter <u>2/</u> Pct.	Chip Yield Per Hundred <u>3/</u> Pounds
Gibbon (Buffalo Co.)				
38.53-20	29.7	48.2	14.6	30.0
4.56-9	28.9	52.5	15.6	31.8
156.51-2	27.8	-----	19.5	38.2
83.55-8	26.6	51.3	16.7	34.5
302.50-5	23.3	-----	15.8	37.3
Blanca	23.0	69.0	18.0	35.5
Haig	22.4	69.9	16.2	34.5
77.57-1	22.1	57.8	15.0	32.7
396.55-1	22.0	61.6	14.5	32.7
201.55-3	21.6	56.6	16.7	35.5
396.55-21	21.5	-----	15.0	31.8
186.55-3	21.1	58.8	16.6	37.3
Dazoc	21.0	65.3	16.0	30.9
114.51-2	20.3	54.5	18.2	35.5
28.51-4	19.9	53.2	16.7	33.6
27.55-2	19.8	-----	15.2	33.6
Pioneer	18.6	-----	15.4	34.5
396.55-3	16.8	43.6	14.8	32.7
Bounty	16.2	55.6	15.6	33.6
104.57-1	14.6	54.7	14.8	32.7
$\bar{x} \pm s_{\bar{x}}$	21.9 $\pm$ 3.9	56.8 $\pm$ 2.2	14.2 $\pm$ 2.4	33.9 $\pm$ 2.1

1/ Rd based on white standard No. 25-427 and taken with Hunter Color Difference meter.

2/ Oil extracted from 10 gms. chips in 75 ml. toluene; converted percent dry matter in chips to 100 pounds at fresh potatoes.

3/ Pounds per 100 pounds of fresh potatoes.

Nebraska table 9. Scab type and yield of 98 selections tested at ScottsBluff and Alliance, Nebraska in 1962 (2 reps. per location).

Selection	Scab type	Yield 5 hills lbs.	Parents	
			Female	Male
59.41-P1	1.2	3.5	A-5	C-66
101.56-3	1.2	5.4	115.52-1	114.51.2
80.59-1	1.2	3.2	1.57-1	Self
104.59-1	1.2	4.2	91.57-H18	91.57-H19
126.59-3	1.2	3.7	107.57-H19	107.57-H37
156.52-2	1.5	4.2	302.48-1x	120.50-2
38.53-18	1.5	5.4	Haig	Self
38.53-20	1.5	5.0	Haig	Self
24.58-1	1.5	4.0	102.53-8	104.52-2
Wisc 143.52	1.5	4.7		
114.51-2	1.8	5.6	47.47-1	134.47-2x

continued



Nebraska table 9, continued.

396.55-21	1.8	5.1	<u>RedBake</u>	ND 11
99.56-1	1.8	<u>7.0</u>	<u>104.52-2</u>	<u>114.51-2</u>
22.58-1	1.8	5.2	<u>222.51-9</u>	<u>104.52-2</u>
94.58-2	1.8	6.7	<u>104.52-2</u>	<u>98.53-1</u>
176.50-3	2.0	5.5	385.48-4	311.43-1
77.51-2	2.0	4.9	82.47-5x	Self
412.55-2	2.0	5.0	<u>RedBake</u>	107.52-13
90.56-1	2.0	6.6	<u>131.50-2</u>	<u>114.51-2</u>
150.56-2	2.0	4.0	215.50-2	53.52-1
18.58-1	2.0	4.1	<u>114.49-1x</u>	<u>104.52-2</u>
33.59-1	2.0	5.5	<u>320.48-1-1</u>	<u>223.48-2-3</u>
143.49-1	2.2	4.6	Arnica	59.41-P1
178.55-1	2.2	4.5	77.44-1	<u>131.50-2</u>
84.56-1	2.2	5.7	<u>93.48-1</u>	<u>114.51-2</u>
96.56-1	2.2	3.8	<u>222.51-9</u>	<u>114.51-2</u>
77.57-1	2.2	<u>9.9</u>	<u>45.51-3</u>	378.48-2x
A221.57-2	2.2	4.6	83.55-3	<u>85.55-2</u>
24.59-H <sub>2</sub>	2.2	3.1	107.57-H <sub>15</sub>	<u>93.48-1-1</u>
26.59-1	2.2	3.8	156.48-2-2	Self
39.59-3	2.2	5.3	34.51-1	295.48-1-1
57.59-1	2.2	6.2	<u>114.49-1x</u>	114.49-1-1
ND 457-1-10	2.2	4.4		
164.51-2	2.5	3.7	194.49-2X	86.48-1
9.55-1	2.5	5.9	45.47-7X	25.47-7X
97.56-1	2.5	6.6	395.51-1	<u>114.51-2</u>
185.57-1	2.5	<u>7.3</u>	27.55-1	<u>18.53-2</u>
136.58-1	2.5	<u>7.9</u>	W21x-3	Wisc 137
136.58-3	2.5	<u>7.5</u>	W21x-3	Wisc 137
32.59-1	2.5	3.2	228.48-2-3	Self
112.59-1	2.5	4.9	91.57-H <sub>33</sub>	91.57-H <sub>31</sub>
139.59-1	2.5	6.6	107.57-H <sub>15</sub>	107.57-H <sub>36</sub>
222.51-9	2.8	2.3	86.48-1	368.48-1
398.55-13	2.8	4.7	<u>93.48-1</u>	ND 11
136.57-2	2.8	5.1	<u>77.51-2</u>	<u>90.49-1x</u>
202.57-1	2.8	<u>9.2</u>	<u>90.49-1x</u>	<u>240.54-1</u>
202.57-2	2.8	<u>6.9</u>	<u>90.49-1x</u>	240.54-1
22.59-1	2.8	4.2	<u>93.48-1-2</u>	<u>93.48-1-1</u>
53.59-1	2.8	4.5	86.49-1-1	<u>90.49-1-1</u>
84.59-3	2.8	5.0	<u>90.49-1x</u>	Self
D-400	2.8	3.9		
180.56-1	3.0	5.3	215.50-2	53.53-2
139.58-1	3.0	4.5	<u>104.52-2</u>	191.50-1
48.59-1	3.0	5.3	385.48-1-1-1	385.48-1-1
83.59-1	3.0	5.7	107.57-2	Self
85.59-1	3.0	3.5	90.49-1-1	<u>90.49-1x</u>
125.59-1	3.0	5.4	107.57-H <sub>15</sub>	<u>107.57-H<sub>37</sub></u>
D - 387	3.0	<u>7.3</u>		
I - 78	3.0	4.0		
38.53-6	3.2	4.2	223.48-1	Self
199.55-1	3.2	5.2	<u>164.51-2</u>	131.50-2
92.56-4	3.2	5.7	<u>212.50-2</u>	<u>114.51-2</u>
35.58-1	3.2	5.3	29.47-2	Self

continued

Nebraska table 9, continued.

95.58-1	3.2	6.3	9.53-5	98.53-1
116.59-3	3.2	6.2	94.57-H <sub>7</sub>	Self
41.49-4	3.5	<u>7.0</u>	117.43-3	Self
76.50-4	3.5	5.3	15.40-2	83.48-3
398.55-2	3.5	5.9	<u>93.48-1</u>	Nd 11
124.56-1	3.5	5.7	156.52-2	<u>222.51-9</u>
88.58-1	3.5	5.4	<u>98.53-1</u>	<u>392.51-3</u>
119.59-5	3.5	5.6	107.57-H <sub>17</sub>	107.57-H <sub>15</sub>
136.59-2	3.5	<u>8.9</u>	91.57-H <sub>12</sub>	Self
143.50-2	3.8	5.9	385.48-1	Self
181.51-2	3.8	<u>8.3</u>	30.48-4	254.48-1
162.57-1	3.8	5.5	84.51-1	215.50-2
2.59-1	3.8	4.6	295.48-1-1	<u>117.43-3-1</u>
42.59-3	3.8	5.6	<u>133.53-1-1</u>	<u>295.48-1-1</u>
47.59-2	3.8	4.0	385.48-1-1	Self
116.59-2	3.8	3.9	94.57-H <sub>7</sub>	Self
132.59-1	3.8	2.8	295.48-1-1	<u>133.53-1-1</u>
137.59-2	3.8	4.4	91.57-H <sub>37</sub>	91.57-H <sub>15</sub>
78.55-3	4.0	<u>8.0</u>	320.48-1x	<u>93.48-1</u>
50.57-3	4.0	5.6	ND 23	<u>156.52-2</u>
51.58-1	4.0	6.0	<u>20.44-2</u>	<u>140.47-1</u>
A108.57-1	4.0	3.4	<u>140.47-1</u>	Self
120.59-1	4.0	4.4	107.57-H <sub>16</sub>	Self
121.59-1	4.0	6.4	369.48-1-1	107.57-H <sub>19</sub>
9.58-3	4.2	4.6	<u>114.49-1x</u>	<u>164.51-2</u>
131.50-2	4.5	<u>7.1</u>	117.43-3	368.48-3
83.55-8	4.5	6.3	215.50-2	<u>93.48-1</u>
129.59-1	4.5	1.8		
117.43-1	4.8	4.7	A 54	49.40-1
78.55-2	4.8	5.8	320.48-1x	<u>93.48-1</u>
85.55-1	4.8	4.8	45.51-4	<u>93.48-1</u>
4.58-1	4.8	5.4	Redbake	59.41-P <sub>1</sub>
38.49-6	5.0	6.2	<u>8.38-8</u>	117.43-3
156.51-2	5.0	<u>7.0</u>	161.49-1	<u>143.49-1</u>
58.58-2	5.0	6.4	<u>222.51-9</u>	<u>140.47-1</u>
Mean	2.87	5.31	C.V. for scab = 41.8%	
L.S.D..05	1.67	2.47	C.V. for yield = 34.8%	
.01	2.19	3.24		

## Analysis of Variance (Scab Type)

Source	df	M.S.	Parameters (V = Variance)
Locations	1	21.59**	V <sub>1</sub> = 0.10
Reps. in L.	2	0.05	V <sub>r</sub> = 0.00
Selections	97	4.04**	V <sub>g</sub> = 0.72 (genotypic)
S X L	97	1.14	V <sub>gl</sub> = -0.16
Error	194	1.45	V <sub>e</sub> = 1.45
			V <sub>p</sub> = 2.01 (phenotypic)
			V <sub>p</sub> = 1.00 (Selections mean)

Heritability (plot basis) = 0.36

" (selection mean) = 0.72

Nebraska table 9, continued.

Analysis of Variance (Yield)			
Locations	1	652.07**	Vl = 3.30
Reps in L.	2	2.07	Vr = 0.01
Selections	97	8.37**	Vg = 0.87 (genotypic)
S X L	97	4.88**	Vgl = 0.86
Error	194	3.15	Ve = 3.15
			Vp = 4.88 (phenotypic)
			Vp = 2.09 (selections mean)
Heritability (plot basis) = 0.18		Heritability (selections means) = 0.42.	

Nebraska table 10. Yield, grade and specific gravity of potatoes produced in south central Nebraska as early processing potatoes, 1962 (means of 3 replicates).

Selection	Total Yield Per Acre Cwt.	Percent each grade				U.S.#1 over 2½"	Specific Gravity
		U.S. No. 1	Defects		Under 1 7/8"		
			Scab	Others			
Hastings (Adams Co.)							
Bounty	239	87.2	0.0	1.0	11.8	89.3	1.076
Dazoc	200	85.8	0.0	1.2	12.9	68.4	1.069
Blanca	189	67.2	0.0	0.0	32.8	54.6	1.066
Kennebec	186	89.2	0.0	0.6	10.2	74.6	1.066
Haig	174	78.1	0.0	1.2	20.7	60.8	1.071
156.51-2	166	81.9	0.0	0.0	18.1	75.7	1.078
Pioneer	161	80.3	0.0	1.8	17.8	74.3	1.071
302.50-5	161	73.3	0.4	2.4	23.9	61.7	1.065
$\bar{x}$	185						1.070
L.S.D. .05	77						0.002**
McCook (Red Willow Co.)							
Bounty	363	8.5	0.0	4.3	7.3	89.3	1.076
Dazoc	338	91.7	0.0	2.8	5.5	95.5	1.077
Blanca	319	90.8	0.0	1.5	7.7	74.3	1.085
Kennebec	308	90.2	1.1	2.9	5.7	86.0	1.078
Haig	291	83.7	0.0	7.4	8.9	83.6	1.080
156.51-2	284	83.1	0.0	6.1	10.8	95.7	1.094
Pioneer	282	82.8	0.0	5.8	11.4	71.1	1.078
302.50-5	232	85.9	0.0	5.4	8.7	82.9	1.078
$\bar{x}$	301						1.081
L.S.D. .05	79						0.004**
Red Cloud (Webster Co.)							
Bounty	376	84.0	0.0	7.6	8.5	74.0 <sup>1/</sup>	1.079
Dazoc	372	77.7	0.0	12.4	9.9	92.0	1.071
Blanca	357	78.3	0.0	1.8	20.0	100.0	1.082
Kennebec	350	72.1	0.0	20.0	7.9	100.0	1.078
Haig	337	83.0	0.0	8.7	8.3	100.0	1.073
156.51-2	329	79.7	0.0	3.9	16.4	100.0	1.095
Pioneer	314	79.8	0.0	7.9	12.3	100.0	1.072
302.50-5	308	76.4	0.0	6.7	14.0	89.0	1.075
$\bar{x}$	342						1.078
L.S.D. .05	108						0.004**

<sup>1/</sup> Based on one 10-pound sample.



Nebraska table 11. Yield, grade and specific gravity of potatoes grown with irrigation in central Nebraska, 1962 (means of 3 replicates).

Selection	Total	Percent each grade				U.S.#1 over 2½"	Specific Gravity
	Yield	U.S. No. 1	Defects		Under 1 7/8"		
	Per Acre Cwt.		Scab	Others			
Dazoc	237	76.4	1.6	1.0	21.1	83.7	1.063
Bounty	284	91.8	0.1	0.6	7.5	95.5	1.062
Haig	223	92.4	1.5	0.8	5.3	95.5	1.064
Blanca	258	89.6	0.0	0.5	9.9	88.7	1.073
156.51-2	244	86.6	0.0	1.5	11.9	91.7	1.079
Pioneer	330	89.4	0.0	0.0	10.6	84.8	1.061
201.55-3	235	85.6	0.0	6.6	7.8	89.5	1.067
186.55-3	295	90.4	0.0	1.5	8.1	92.9	1.066
396.55-1	311	87.2	0.3	0.0	12.5	90.4	1.056
396.55-21	262	90.0	0.0	0.4	9.6	89.9	1.059
27.55-2	306	93.7	0.0	0.2	6.1	94.8	1.060
302.50-5	279	39.7	0.0	0.5	9.7	86.5	1.062
396.55-3	261	88.9	0.0	2.6	8.4	97.8	1.058
28.51-4	233	77.3	0.0	14.8	7.9	97.5	1.066
114.51-2	272	84.2	0.0	2.4	13.5	81.9	1.073
38.53-20	213	89.8	0.0	0.9	9.4	79.9	1.056
83.55-8	311	86.8	0.0	3.6	9.5	97.3	1.066
4.56-9	302	95.2	0.0	1.0	3.8	96.2	
77.57-1	346	90.9	0.0	4.9	4.2	95.8	--
104.57-1	255	80.3	0.0	5.3	14.4	86.0	--
$\bar{x}$	272						1.064
L.S.D. .05	87						0.002

Nebraska table 12. Yield, grade and specific gravity of potatoes produced with irrigation in western Nebraska in 1962 (means of 3 replicates).

Selection	Total	Percent each grade				U.S.#1 over 2½"	Specific Gravity
	Yield	U.S.	Defects		Under		
	Per Acre	No. 1	Scab	Others	1 7/8"		
Cwt.							
Dutch Flats (Sioux Co.)							
Bounty	272	71.9	15.8	2.7	9.5	30.4	1.072
Haig	290	83.6	0.0	3.4	13.0	29.2	1.072
Blanca	307	78.5	0.0	3.6	18.0	27.43	1.075
156.51-2	334	50.0	12.9	12.2	25.0	29.5	1.086
Pioneer	286	63.1	20.7	9.1	7.1	26.5	1.076
201.55-3	340	76.2	5.2	3.3	15.2	28.2	1.073
186.55-2	279	83.8	2.3	10.0	8.0	29.0	1.074
396.55-1	318	73.3	10.4	9.1	7.0	27.8	1.073
396.55-21	276	82.4	1.8	.8	15.0	25.7	1.077
27.55-2	271	65.4	21.4	5.4	8.0	29.6	1.077
302.50-5	290	72.5	1.5	12.7	13.4	25.0	1.070
396.55-3	258	76.8	5.5	8.8	8.8	30.5	1.066
28.51-4	264	65.7	0.0	18.7	15.6	24.9	1.070
114.51-2	295	71.1	0.9	8.1	19.9	26.8	1.078

continued

Nebraska table 12, continued.

38.53-20	282	55.4	0.5	3.3	40.8	21.5	1.069
83.55-8	327	46.2	31.4	5.1	17.3	26.9	1.072
156.55-2	304	66.6	2.3	8.1	22.9	19.4	1.066
4.56-9	292	79.7	1.1	1.6	17.6	23.3	1.067
77.57-1	327	78.4	0.3	13.3	8.1	30.3	1.064
104.51-1	260	49.2	0.6	8.6	41.5	19.2	1.067
$\bar{x}$	293						1.072
L.S.D. .05	66						.002
Mirage Flats (Sheridan Co.)							
Vines frosted September 8							
Bounty	153	56.9	7.3	6.2	29.7	24.8	1.067
Haig	132	63.4	3.4	6.2	27.1	23.4	1.070
Blanca	147	50.1	1.0	6.9	42.1	24.9	1.071
156.51-2	134	44.5	4.0	3.9	47.6	24.3	1.079
Pioneer	157	33.6	19.5	23.9	23.0	23.3	1.067
201.55-3	162	57.4	12.3	8.0	22.3	23.6	1.071
186.55-2	121	59.1	1.73	11.8	26.3	24.3	1.063
396.55-1	161	48.7	1.7	33.7	16.0	27.1	1.066
396.55-21	171	66.0	5.1	4.20	24.6	10.0	1.065
27.55-2	146	68.8	9.9	10.4	11.1	26.0	1.068
302.50-5	182	58.9	2.6	11.8	26.8	23.2	1.068
396.55-3	143	54.8	8.2	20.2	16.8	24.6	1.062
28.51-4	196	56.9	0.0	19.4	24.1	19.5	1.076
114.51-2	127	54.9	3.7	8.1	33.2	19.7	1.071
38.53-20	163	68.9	1.8	3.5	25.7	24.0	1.067
83.55-8	130	47.0	6.9	10.1	35.9	24.1	1.069
156.52-2	147	44.2	0.6	6.5	48.8	33.3	1.062
4.56-9	165	63.3	3.8	10.7	22.3	23.9	1.063
77.57-1	157	67.1	3.9	18.1	11.0	26.1	1.061
104.57-1	133	48.3	3.2	8.6	39.9	21.2	1.063
$\bar{x}$	154						1.067
L.S.D. .05	63						.003

NEW HAMPSHIRE  
Paul T. Blood  
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In 1962, 13 varieties of potato were grown at Northwood New Hampshire. Each variety was grown in 3 replications. The rows were 25' long and the seeds were spaced 10" apart in the rows.

The data for yield, specific gravity and chip color are given in New Hampshire tables 1 and 2.

The L.S.D. at the 5% level was 111 cwt. If Green Mountain is taken as the check and 111 cwt. taken as the measure of significance, 7 other varieties were in the same class as Green Mountain for yield of tubers above 1½ inches and the other 5 were significantly lower (New Hampshire table 1).

The L.S.D. at the 5% level for specific gravity was 0.006. Green Mountain had the highest specific gravity but 4 other varieties, Golden Chip, Kennebec, Mohawk, 46121 were not significantly different from Green Mountain in dry matter content.

The chip color of all varieties was very dark, probably because the samples got too cold before conditioning and then were not conditioned long enough. There were significant differences in color but none of the chips would be commercially acceptable.

New Hampshire table 1. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for the 13 potato varieties grown at Northwood, New Hampshire, 1962.

<sup>1/</sup> Variety	Yield per acre above 1-1/2"	Yield 1-7/8 to 4 inches	Yield 2-1/4 to 4 inches	Specific gravity	Chip Color
	Cwt.	Pct.	Pct.		
Golden Chip	519	93.8	88.4	1.088	7.3
Green Mountain	513	97.8	89.2	1.092	10.0
B4491-12	493	94.4	86.4	1.085	7.4
Kennebec	472	96.8	91.5	1.086	7.9
Mohawk	460	95.8	91.8	1.091	9.8
B2894-24	423	96.7	87.6	1.076	9.8
Ona	413	98.2	88.9	1.081	9.7
46121	405	95.0	83.5	1.091	8.8
Superior	370	97.6	91.8	1.081	7.8
Norland	354	97.8	82.4	1.069	8.1
Plymouth	338	98.0	85.7	1.071	7.9
B3604-1	334	95.4	80.1	1.073	9.6
Katahdin	329	95.8	86.2	1.076	9.1
43-50					9.9
L.S.D. 0.05	111			0.006	0.7
L.S.D. 0.01	151			0.008	1.0

<sup>1/</sup> Varieties arranged in descending order of yield.

Seedpieces of all varieties spaced 10 inches apart.



New Hampshire table 2. Percent of total yield distribution by grade size classes of 13 potato varieties grown at Northwood, New Hampshire, 1962.

Variety <sup>1/</sup>	1-1/2 to 1-7/8 inches	1-7/8 to 2-1/4 inches	2-1/4 to 2-7/8 inches	2-7/8 to 3-1/4 inches	3-1/4 to 4 inches	Over 4 inches
Golden Chip	0.8	4.9	24.5	32.7	31.2	5.9
Green Mountain	1.2	8.6	32.9	37.6	18.7	1.0
B 4491-12	2.0	8.0	22.7	33.1	30.6	3.6
Kennebec	1.1	5.3	27.8	32.2	31.5	2.1
Mohawk	0.7	4.0	17.6	27.0	47.2	3.5
B2894-24	1.8	9.1	29.0	32.1	26.5	1.5
Ona	1.2	9.3	32.4	28.9	27.6	0.6
46121	2.2	11.5	36.8	24.9	21.8	2.8
Superior	0.7	5.8	30.4	33.1	28.3	1.7
Norland	2.0	15.4	47.7	28.8	5.9	
Plymouth	2.0	12.3	44.2	28.1	13.4	
B3604-1	4.0	15.3	36.8	27.0	16.3	0.6
Katahdin	2.1	9.6	35.6	31.1	19.5	2.1

<sup>1/</sup> Varieties arranged in descending order of yield.  
Seedpieces spaced 10 inches apart - all varieties.

Fertilized at the rate of 150-150-150 L.C. per acre.

Planted - May 14, 1962.

Harvested - October 1 and 2, 1962.

NEW JERSEY  
John C. Campbell  
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A summary of 3 potato variety trials are presented in which several recently introduced varieties are compared with standard varieties. The major emphasis in these studies is to find varieties that will produce high yields of tubers that have a high specific gravity when grown under relatively high temperatures. Such potatoes would be better suited for boiling and baking. We are also looking for varieties that will process into good chips and frozen french fries at harvest and after storage.

In addition to the relatively large scale variety tests over 100 seedlings were evaluated at two locations for tuber type, yield, specific gravity and processing quality.

In the trial on the Simonson Farm, Cranbury (New Jersey table 1) 18 varieties were replicated 4 times in 2-row plots 50 feet long. The new varieties Hunter and Avon from Canada Department of Agriculture, Fredericton, New Brunswick and Superior from Swanee Farms, Elkhorn, Wisconsin produced above average yields and were exceeded only by Green Mountain and Kennebec.

Varieties and seedlings grown in 1 to 3 two-row plots had given promising results in small plots in 1961. The varieties showing the greatest promise from the standpoint of yield, appearance and acceptable specific gravity were: B69-16, F5459, B3563-2 and F5362. Seedlings B2894-24, Wyll22, B3352-8, B3602-4 (Ona) and B355-35 produced good yields but their specific gravity was relatively low (New Jersey table 2).

In addition to the seedlings listed in table 2 more than 60 USDA seedlings, selected at Chapman Farm in Maine in 1961 were grown in 15-hill plots and 23 of these gave promising yields and will be repeated in 1963 in larger plots.

In the cooperative study with Seabrook Farms Company, 16 named varieties and 29 seedlings obtained from USDA, Wisconsin, Nebraska and Canada were planted in 4 replicated single-row plots, 40 feet long (New Jersey table 3. Eight additional USDA seedlings secured through Rutgers were planted in 48, 20, 10 or 5-hill plots but were not replicated.

Graded yields and the specific gravity of all varieties and seedlings was obtained and samples of all lots with reasonably satisfactory yield and a specific gravity of 1.070 or above were processed into frozen french fries by the Seabrook Quality Control Laboratory immediately after harvest.

The frozen french fries were heated in an oven in the recommended manner and evaluated for color, texture and flavor. The following varieties were rated good. Superior, B3556-11, B595-76, Ag 210, W527, Neb.302.50-5, Neb.83.55-8, F5459 and La 61-162.

Several other seedlings produced acceptable french fries. These will be tested again in 1963.

The variety trial on the George Rue Farm, Imlaystown, was in the nature of a demonstration. Fifteen varieties were planted in duplicate 2-row plots each 300 feet long. At harvest each plot was divided into 3 sections and yields obtained. The average yields and specific gravity are listed in New Jersey table 4. Superior and LaRouge were the highest yielding new varieties comparing very favorably with Kennebec and Chippewa.

Following storage at 40-45° F. for 3 months, samples from all varieties and seedlings from all 3 trials that produced average yields and a specific gravity of 1.065 or higher were submitted to the Food Science Department of Rutgers for processing into chips and french fries. The results of this evaluation were not finished in time for inclusion in this report.

A summary showing the average yield of most of the varieties and seedlings grown at 2 or more locations is given in New Jersey table 5.

New Jersey table 1. Total, U. S. No. 1 yields and specific gravity of varieties tested on the Simonson Farm, Cranbury, New Jersey, 1962.

Variety	Yield per acre		U. S.		Specific gravity	Remarks
	Total <sup>1/</sup>	U.S.No.1	No. 1	B size		
	Cwt.	Cwt.	Pct.	Pct.		
Green Mountain	373	339	91	4	1.079	4% knobby
Kennebec	358	340	95	3	1.069	2% growth cracks and knobby
Hunter	326	303	93	4	1.077	2% knobby
Chippewa	325	309	95	4	1.060	No off-grade tubers
Pungo	319	293	92	5	1.074	1% growth cracks
Superior <sup>2/</sup>	315	296	94	3	1.071	2% growth cracks, appearance good
Avon	305	287	94	5	1.072	irregular shape, 1% growth cracks
LaRouge	298	274	92	4	1.063	Red-thin skin, 4% growth cracks and knobby
Blanca	296	263	89	9	1.073	Small-medium, flaky skin
Catoosa	283	258	91	7	1.059	Red-2% growth cracks
Plymouth	277	266	96	3	1.071	1% growth cracks
Superior <sup>3/</sup>	275	264	96	2	1.071	1% knobby, good appearance
Keswick	270	259	96	3	1.070	large tubers, medium deep eye
Cobbler	270	251	93	5	1.066	1% knobby
Arenac	270	240	89	7	1.072	4% growth cracks, good appearance
Katahdin	269	261	97	2	1.064	no off grades
LaChipper	252	234	93	6	1.062	resembles Cobbler
Fundy	235	223	95	5	1.066	good looking
L.S.D. 5%	36 cwt					
L.S.D. 1%	46 cwt					

<sup>1/</sup> Average of 4 replicates, 2-row plots 50 feet long

<sup>2/</sup> Seed furnished by Swanee Farms, Saxon, Wisconsin

<sup>3/</sup> Seed furnished by Starks Farms, Rhinelander, Wisconsin



New Jersey table 2. Total, U. S. No. 1 yields and specific gravity of varieties and seedlings tested on the Simonson Farm, Cranbury, New Jersey, 1962.

Variety	Yield per acre		U. S.		Specific gravity	Remarks
	Total	U.S.No.1	No. 1	B size		
	Cwt.	Cwt.	Pct.	Pct.		
B69-16*	378	355	94	5	1.072	No off grades
Ona	368	342	93	6	1.062	No off grades
F5459	353	328	93	3	1.084	Large tubers, 3% knobby, trace scab
B 355-35	348	323	93	4	1.067	1% knobby
B 3563-2	326	313	96	4	1.078	No off grades
La 62-162	323	291	90	5	1.061	Red, 5% growth cracks
F 5362	305	281	92	2	1.073	3% knobby, 2% scabby
Keweenaw	289	272	94	4	1.068	1% knobby
F 5348	286	260	91	6	1.081	1% poor shape
B 3802-15	265	236	89	8	1.070	1% knobby, 1% culls
La 91-143	264	238	90	7	1.071	2% growth cracks
F 5660	262	241	92	5	1.076	2% knobby
F 5356	252	227	90	5	1.076	4% poor shape
B 3453-2	251	221	88	10	1.071	1% culls
La 61-125	212	187	88	4	1.067	6% skin spot
Emmet	204	149	73	10	1.072	13% growth cracks 2% skin spot
B 2894-24	559	537	96	4	1.066	No off grades
Wy 1122	462	448	97	3	1.062	No off grades
B 3352-8	348	327	94	3	1.067	3% growth cracks
B 926-9	322	296	92	6	1.058	1% growth cracks
Snowflake	215	194	90	9	1.064	No off grades
B 3604-19	174	158	91	5	1.061	3% knobby
B 3556-12	169	78	46	40	1.077	14% culls, no good

\* 1 to 3 replications in single-row plots 50 feet long for all varieties below this point. Not analyzed statistically.

New Jersey table 3. Potato variety trials in cooperation with Seabrook Farms, Seabrook, New Jersey, 1962.

Replicated (4) variety trials:		Yield per acre			Specific gravity	Harvest Date
Variety	Source	Total	U.S.1	U.S.1		
		Cwt.	Cwt.	Pct.		
Onaway	USDA	332	315	95	1.075	9/6
B 3172-13	"	322	252	76	1.074	8/5
B 3319-30	"	358	340	95	1.071	9/6
B 3352-8	"	342	321	94	1.078	9/2
B 3427-7	"	240	211	88	1.065	9/6
B 3429-22	"	301	289	96	1.075	9/21
B 3556-11	"	302	284	94	1.083	9/21
B 3570-5	"	265	246	93	1.069	9/6
B 3599-8	"	324	305	94	1.073	9/24
B 3602-4 (Ona)	"	322	287	89	1.076	9/24
B 3604-19	"	377	362	96	1.066	8/15
B 3626-13	"	296	255	86	1.066	8/15
B 369204	"	308	283	92	1.076	9/6
B 3876-25	"	300	282	94	1.083	9/6
B 595-76	"	275	217	79	1.080	9/24

continued

New Jersey table 3, continued.

Ag. 29 (Superior)	Wisc.	358	344	96	1.079	9/7
Ag. 210	"	284	250	88	1.075	8/15
Ag. 383	"	300	282	94	1.074	9/7
W. 527	"	237	213	90	1.090	9/8
W. 543	"	247	215	87	1.073	9/8
186.55-3	Neb.	332	282	85	1.076	9/24
302.50-5	"	362	348	96	1.071	9/24
315.49-3X	"	337	327	97	1.072	9/24
83.55-8	"	379	349	92	1.076	9/24
Bounty	"	398	362	91	1.072	9/24
Avon	Canada	330	317	96	1.079	9/24
Hunter	"	396	356	90	1.082	9/24
Keswick	Comm.	275	253	92	1.077	9/24
F. 5348	Canada	357	314	88	1.094	9/24
F. 5356	"	317	304	96	1.080	9/24
F. 5362	Canada	273	265	97	1.090	9/24
F. 5459	"	346	322	93	1.094	9/24
F. 5660	"	238	2.2	89	1.086	9/25
Cobbler	(Comm.)	357	332	93	1.076	9/8
Superior (Swan)	Rutgers	406	394	97	1.071	9/8
Arenac	"	313	294	94	1.086	9/8
Blanca	"	292	242	83	1.082	9/25
LaRouge	"	435	409	94	1.068	8/15
Fundy	"	308	293	95	1.073	8/15
Catoosa	"	333	316	95	1.064	8/15
LaChipper	"	361	321	89	1.074	8/16
Snowflake	"	284	244	86	1.072	8/16
La-62-162	"	350	308	88	1.080	9/25
La-61-125	"	305	287	94	1.073	9/8
La-91-143	"	314	295	94	1.079	9/10
<u>Single row plots (48 hills)</u>						
B. 3563-2	USDA	379	368	97	1.086	9/10
ND 4192-3	ND	373	343	92	1.074	9/10
ND 4524-7R	"	467	448	96	1.065	9/10
ND 3815-1R	"	451	433	96	1.070	9/10
ND 4121-25	"	339	312	92	1.073	8/16
ND 156.51-2	Neb.	297	244	82	1.084	8/16
<u>Single row plots (20 hills)</u>						
B 2067-52	Rutgers	548	460	84	1.068	9/25
B 4090-3	"	674	613	91	1.066	9/25
B 4093-2	"	497	472	95	1.070	9/10
B 4093-15	"	431	375	87	1.065	9/10
B 4145-3	"	397	361	91	-	9/10
B 4574-5	"	500	470	94	1.065	9/10
B 4606-8	"	597	537	90	1.085	9/25
B 4759.2	"	274	236	86	1.068	9/10
B 4772-1	"	435	418	96	1.075	9/10
B 4784-1	"	695	632	91	1.062	9/25
B 4789-2	"	415	380	94	1.065	8/16
B 4799-7	"	384	315	82	1.064	8/16
B 4807-7	"	664	637	96	1.067	9/10

continued

New Jersey table 3, continued.

B 4808-22	Rutgers	353	321	91	1.061	9/10
B 4809-7	"	495	475	96	1.062	9/25
B 4812-16	"	304	274	90	1.069	9/25
B 4814-2	"	372	338	91	1.074	9/10
B 4828-4	"	573	544	95	1.070	9/15
B 4828-11	"	465	428	92	1.075	9/15
B 4829-7	"	367	360	98	1.069	8/16
B 5088-24	"	274	255	93	1.067	8/16
B 328-29	"	317	260	82	1.068	8/16
Emmet	"	361	282	78	1.077	8/16
Keweenaw	"	464	399	86	1.070	9/15
B 69-16	"	497	447	90	1.069	9/15
B 926-9	"	337	313	93	1.061	8/16
B 3453-2	"	417	359	86	1.072	9/15
B 3556-12	"	158	52	33	No good	10/2
B 3802-15	"	517	460	89	1.076	8/16
B 4093-15	"	570	547	96	1.070	9/15
B 331-32	"	580	551	95	1.082	9/15
B 4083-3	"	540	497	92	1.070	9/25
Wy 1122	"	418	397	95	1.067	9/14
B 2894-24	"	478	430	90	1.068	9/25
B 3352-8	"	574	505	88	1.067	9/25
B 355-35	"	440	387	88	1.067	9/25
B 3563-2	"	473	444	94	1.086	9/25
B 3604-19	"	476	462	97	1.067	8/16
<u>Single row plots (10 hills)</u>						
B 3478-58	Rutgers	576	-	93	1.077	9/14
B 3599-8	"	352		94	1.063	9/25
B 4314-10	"	519		95	1.065	8/16
B 4522-8	"	390		87	1.074	9/14
B 4552-5	"	481		91	1.072	9/25
B 4552-10	"	379		91	1.070	8/16
B 4850-26	"	529		89	1.074	9/14
B 4774-8	"	417		96	1.062	9/14
B 4777-5	"	336		89	1.072	8/16
B 4782-4	"	323		87	1.072	9/14
B 4795-3	"	517		89	1.089	8/16
B 4987-14	"	566		98	1.061	9/14
B 4987-30	"	175		83	1.066	9/14
B 5001-14	"	302		96	1.060	8/16
B 5038-5	"	388		91	1.063	10/2
B 5042-2	"	397		86	1.070	9/25
B 5052-4	"	405		94	1.063	8/16
B 5060-14	"	436		92	1.066	10/2
B 5061-21	"	421		80	1.065	8/16
B 5066-4	"	508		91	1.079	8/16
B 5088-22	"	463		87	1.071	8/16
B 5089-14	"	293		88	1.074	9/25
B 5089-18	"	464		83	1.065	8/16
B 5089-34	"	136		87	1.068	8/16
B 5163-10	"	535		97	1.067	9/25
B 5164-8	"	445		82	1.067	9/14
B 3599-8	"	382		51	1.072	9/14

continued



New Jersey table 3, continued

Planting date, April 25, 1962; method of planting, by hand, tubers 10" apart, in rows 40 feet long, rows 3 feet apart; furrows opened with potato planter; fertilizer, 1200 lbs. per acre of 10-20-20 (Sulpo-Mag & K from sulphate of potash), side-dressed at planting.

New Jersey table 4. Total, U. S. No. 1 yields and specific gravity of varieties tested on the Rue Farm, Imlaystown, New Jersey, 1962.

Variety	Yield per acre		U. S. No. 1	B Size	Specific** gravity	Remarks
	total*	U. S. No. 1				
	Cwt.	Cwt.	Pct.			
Kennebec	332	315	95	3	1.077	1% growth cracks, poor shape
Superior	311	295	95	4	1.070	1% poor shape, good appearance
Chippewa	308	293	95	4	1.063	1% skin spot
Cobbler	306	272	89	6	1.074	1% knobby, 3% skin spot
LaRouge	297	267	90	6	1.068	Red-, 3% growth cracks and knobby
Keswick	288	282	98	2	1.076	No off grade
Pungo	282	262	93	5	1.071	.5% knobby
LaChipper	282	257	91	7	1.067	1% scab, Cobbler type
Avon	281	261	93	4	1.073	No off grade
Hunter	279	262	94	4	1.073	.5% growth cracks
Plymouth	257	234	91	3	1.071	6% growth cracks and poor shape
Fundy	247	222	90	4	1.070	6% poor shape and growth cracks
Blanca	241	183	76	12	1.074	6% growth cracks and knobby
Arenca	231	206	89	8	1.080	3% growth cracks and knobby
Katahdin	219	208	95	4	1.064	Trace scab

\* 1 7/8" diameter.

Plots are two rows wide and 200 feet long.

Averages of 3, 2-row sections 32 feet long from each of 2 replicates 200 feet long total 6 sub-plots. Data not analyzed because of plot arrangement.

\*\* Specific gravity of 5000 grams composite sample weighed in air and water.  
 500 lb. sulfate ammonia + 500 lb. Sul-PO-Mag., broadcast before planting;  
 700 lb. 6-12-6 in bands after planting; 600 lb. lime broadcast May 21;  
 150 lb. ammonium nitrate side dressed; sandy loam pH 4.7; available N 20 lb.,  
 $P_2O_5$  - 12 lb.,  $K_2O$  175 lb. per acre. Planted April 23, 1962; harvested October 22, 1962., George Rue Farm, Imlaystown, New Jersey.

NEW YORK (Upstate)  
E. E. Ewing, J. C. Bohn, and Ora Smith  
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Three potato variety trials were established in Upstate New York. One was located on a mineral soil in Tompkins County. The other two, conducted in cooperation with the respective County Agricultural Extension Agents, were on commercial muck farms in Orleans and Madison Counties. Due to serious water damage the Orleans trial was not harvested.

Certified seed of Superior, LaChipper, and Antigo was obtained from Wisconsin. The Russet Burbank was Minnesota certified seed. Arenac seed was furnished by the Lake City Experiment Station, Lake City, Michigan. Professor L. C. Peterson of the Cornell University Department of Plant Pathology furnished seed of JLS-6. Seed of the other varieties tested was provided by the USDA Station at Presque Isle, Maine.

Each experiment was composed of 4 randomized complete blocks. Individual plots consisted of single rows 25 feet long. Row spacings were 34 inches between paired (planter) rows and approximately 36 inches between unpaired rows. Seed pieces of Russet Burbank were spaced 16 inches apart within the row; all other varieties were spaced at 8 inches. Seed pieces weighed approximately 2 ounces.

The 1962 growing season in Tompkins and Madison Counties was marked by exceptionally dry weather from planting until the middle of August. The trial in Tompkins County was irrigated twice during this period. Rainfall was adequate during August and was excessive during September and October. In general, temperatures were somewhat below normal throughout the season.

Total yields, yields of U. S. No. 1 potatoes, maturity ratings, specific gravities, and grading data are presented in New York tables 1-2. Treatment means which differ by more than the "D.05" values listed in each table are significantly different at the 5% level. The D.05 value is computed by Tukey's Test.

Of the varieties included for the first time in 1962, Ona appeared to be the most promising. Yield, specific gravity, tuber shape, depth of eyes, and percentage of tubers grading U. S. No. 1 all compared very favorably with Katahdin in the one location where Ona was tested. The only drawback noted was a "flaking" or "chapping" of the skin, similar to that which is present in many varieties which are selected for scab resistance. As in past years, JLS-6 also had excellent tuber type and was similar to Katahdin in specific gravity and yield of U. S. No. 1 tubers.

Arenac was outstanding in specific gravity and had good tuber appearance but yields were considerably below Katahdin. This may have been due at least in part to what appeared to be a virus disease in a high percentage of the plants.

New York table 3 shows the results of after-cooking darkening tests on tubers from the 1961 variety trials. Five tubers from each of four field replications in a trial were cooked for 8 minutes in an autoclave at 15 p.s.i. After peeling and cooling they were rated for darkening. Tukey's Test was used to test for significance in differences among treatment means.



The 3 early variety trials were cooked after a very brief storage period and only slight amounts of after-cooking darkening were noted in any of the varieties. Tubers from the other three trials were stored until spring and showed much more darkening. As in past years, Sebago consistently ranked at the top for cooking white. Superior showed a pronounced tendency to develop after-cooking darkening. Arenac and JLR-9 were included only in Orleans County, but at this one location had significantly more darkening than Sebago. Katahdin was close to Sebago in 2 trials, but significantly inferior in Monroe County.

Chip colors from the 1961 variety trials are presented in New York table 4. Samples from Orleans County were stored eight weeks at approximately 40° F., 6 weeks at 50° F., and 5 weeks at room temperature (about 75° F.) before frying. Livingston County samples were at 40° F. 7 weeks, 50° F. 6 weeks, and room temperature 8 weeks. The Monroe County samples were held 5 weeks at 40° F., 5 weeks at 50° F., and 7 weeks at room temperature. Samples from Tompkins County were stored 2 weeks at 40° F. and then 3 weeks at 50° F. before frying.

Chip color was measured on the Agtron model F reflectance colorimeter (Davis and Smith, 1962). The instrument was set so that discs 5005 and 5052.5 gave readings of 0 and 100, respectively. The higher the readings, the lighter the chip color. A reading of 50 or above is considered "acceptable" for typical commercial requirements.

As expected, Kennebec consistently produced light colored chips. The only new variety to excel Kennebec was JLR-9, which was present at only one location. Superior was somewhat variable in chip color but seemed to fall between Katahdin and Kennebec. It may have potential as an early chipping variety.

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Davis, C. O., and O. Smith. 1962. Objective measurement of potato chip color. Potato quality XVII. Potato Chipper 21, No. 11:72, 74, 76.



New York table 1. Potato variety trial (mineral soil). Tompkins County, 1962.

Variety	Yield per acre		U.S. No. 1				U.S. No. 1 Less than Greater		Misshapen		Vine		Comments
	1 7/8"-4"		7/8"-4"		1 7/8"		than 4"		and growth		Specific Maturity		
	Cwt.	Cwt.	Pct.	Pct.	Pct.	Pct.	Sunburn	cracks	gravity	Rating*			
Ona	314	386	81.4	7.2	0.9	8.2	2.4	1.074	2.0	Excellent tuber type.			
R. Rural	309	395	78.2	9.4	0.9	3.0	8.5	1.080	1.8				
Sebago	264	360	73.2	2.7	4.6	14.1	5.4	1.075	1.5				
JLS-6	257	321	80.1	7.2	0.6	9.0	3.1	1.078	4.8	Very good tuber type.			
Katahdin	253	388	65.0	10.0	6.1	15.8	3.1	1.074	3.3				
B4805-1	215	264	81.5	8.1	1.6	3.5	5.3	1.067	6.3	Pink skin.			
B3837-11	215	269	79.7	12.5	---	4.8	3.0	1.068	6.8	Well shaped.			
LaChipper	203	282	72.2	8.0	---	2.4	17.4	1.076	5.0	Poorly shaped.			
Arenac	199	282	70.6	8.9	0.5	12.4	7.5	1.083	4.8	Well shaped, except some deep growth cracks.			
B3725-1	173	288	60.3	9.0	---	8.1	22.6	1.074	5.8	Lumpy, irregular in shape.			
R. Burbank	147	268	55.0	7.5	0.9	2.9	33.8	1.082	2.0	Knobby.			
B4312-21	---	373	(Not graded)							5.5	Very bad growth cracks.		
D.05	91	83						0.012	2.1				

\* Vines rated for maturity August 27 with 9=completely dead; 1=very immature.

Planted May 22; harvested October 16; graded November 7, 1962.

New York table 2. Potato variety trial (muck soil), Madison County, 1962.

Variety	Yield per acre		U.S. No.1	Less than 1 7/8"	Mech. Damage	Misshapen & growth cracks		Scab	Rots	Hollow- Heart in 40 tubers	Specific Gravity
	U.S. No.1	Total				Pct.	Pct.				
	Cwt.	Cwt.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		
Plymouth	274	401	68.3	0.9	16.4	1.9	4.6	1.6	0.2	3	1.071
Katahdin	269	418	64.4	1.3	12.8	3.3	4.8	5.5	0.2	4	1.074
Arenac	254	356	71.4	4.3	9.5	3.4	3.5	0.4	0.1	3	1.082
Emmet	242	418	57.6	1.6	19.9	3.6	10.2	1.2	---	0	1.076
Superior	217	281	77.2	1.9	11.2	0.2	2.4	1.6	---	3	1.072
Antigo	165	244	67.8	4.3	18.6	1.2	2.8	1.0	0.5	0	1.069
D.05	94	131									

Comments: Planted last week in May; harvested October 25; graded November 27 by commercial grading crew. The high percentage mechanical damage was probably due to the very cold weather at time of harvest. Most of the misshapen potatoes found in Emmet were growth cracks. Emmet and Arenac both had shallow eyes, smooth skins, and an attractive tuber type. Superior had a slightly netted or chapped skin with medium deep eyes and somewhat irregularly shaped tubers.

New York table 3. After-cooking darkening, 1961 variety trials.

Erie County, 1st-early		(steamed 8/17/61)	Erie County, 2nd-early		(steamed 9/30/61)
<u>Variety</u>		<u>Rating*</u>	<u>Variety</u>		<u>Rating*</u>
Norglean		8.45	Snowflake		8.35
I. Cobbler		8.25	Chippewa		8.20
Fundy		8.05	Avon		8.15
Norland		8.05	Onaway		8.05
D.05		1.11	D.05		0.61
Wayne County		(steamed 9/11/61)	Orleans County		(steamed 4/13/62)
<u>Variety</u>		<u>Rating*</u>	<u>Variety</u>		<u>Rating*</u>
Superior		9.00	Sebago		8.45
Norglean		8.90	Katahdin		8.10
I. Cobbler		8.90	Kennebec		7.60
Chippewa		8.90	LOH-14		7.55
Norland		8.80	Plymouth		7.30
Snowflake		8.80	Arenac		7.25
Fundy		8.75	Superior		7.05
Avon		8.70	JLR-9		6.75
D.05		0.61	D.05		0.91
Livingston County		(steamed 5/19/62)	Monroe County		(steamed 4/27/62)
<u>Variety</u>		<u>Rating*</u>	<u>Variety</u>		<u>Rating*</u>
Sebago		8.80	Sebago		8.25
Katahdin		8.55	Kennebec		7.70
JLS-17		8.45	ISO-1		7.65
Kennebec		8.40	R. Rural		7.45
Onaway		8.05	R. Burbank		7.40
Plymouth		8.00	IWU-1		7.40
Superior		6.80	Katahdin		7.20
D.05		0.71	Superior		6.70
			D.05		0.93

\*Rated from 1 to 9, where 1=severe after-cooking darkening; 9=no darkening. Means of 5 tubers from each of 4 replications.



New York table 4. Chip colors, 1961 variety trials.

<u>Orleans County</u> (Fried 2/5/62)		<u>Livingston County</u> (Fried 2/27/62)	
<u>Variety</u>	<u>Chip Color*</u>	<u>Variety</u>	<u>Chip Color*</u>
JLR-9	57.5	Kennebec	66.5
Kennebec	52.0	Superior	63.0
Katahdin	51.5	Plymouth	53.8
Sebago	50.8	Katahdin	51.5
Arenac	47.8	JLS-17	50.8
Superior	47.5	Sebago	46.8
LOH-14	43.5	Onaway	42.8
Plymouth	32.8	D.05	15.8
D.05	7.5		

  

<u>Monroe County</u> (Fried 2/22/62)		<u>Tompkins County</u> (Fried 11/13/61)	
<u>Variety</u>	<u>Chip Color*</u>	<u>Variety</u>	<u>Chip Color*</u>
Kennebec	62.3	Katahdin	55.3
R. Burbank	61.5	ISO-2	50.3
R. Rural	58.8	R. Rural	50.0
Superior	56.3	B2894-29	49.5
Katahdin	54.3	Blanca	48.5
IWU-1	53.8	B3692-4	47.0
Sebago	53.3	JLS-6	46.8
ISO-1	52.0	B3696-13	43.3
D.05	16.6	B595-76	36.8
		D.05	

\*Agtron Reflectance Reading, where 50 or higher indicates "acceptable" light chip color.

NEW YORK

R. L. Plaisted and L. C. Peterson

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Weather conditions during the past growing season generally were cool and dry with rainfall being the limiting factor in plant growth. Rainfall varied throughout the State from above to subnormal in amounts. Many localities with subnormal readings were designated disaster areas by the U. S. Department of Agriculture and Ithaca was included within this group. Local growing conditions throughout the State influenced yields and they varied from fair through excellent.

The selection program followed was that described in a previous report. In the first phase of the program, 34,000 seedlings were produced in the greenhouse. More than 29,000 1961-greenhouse-produced tubers were grown in the first-year-selection plot. From these, 2000 selections were made. This number will be significantly reduced during the winter months by disease-resistance tests, in particular, the golden nematode test. About 1000 selections were grown in the single-10-hill plot and 300 individuals were saved for further testing. This number also will be reduced this winter by a combination of tests--tuber solids, after-cooking-darkening and chip color reactions after a period of tuber storage at 40 and 50°, respectively.

In the second phase of the program, yield is the principal criterion for selection. In the first-year-yield trials conducted at Ithaca and Riverhead, 200 selections were grown as 10-hill plots replicated 3 times. Eighty selections were saved for further tests. The second-year-yield trials were like the first-year trials with the exception that individual plots were replicated 6 rather than 3 times. Twenty selections were included in this test and 6 were saved for increase. The third-year-yield trials varied from the second-year trials in plot size--being increased from 10 to 15 hills and, in that some selections were grown in the Bridgehampton rather than the Riverhead plot. A backlog of selections, larger than usually anticipated, were included in this test. Seventy selections were grown of which one-third were saved for further trials in regional plots throughout the State.

The Bridgehampton and Andover plots are regional plots located on the eastern end of Long Island and in the southwestern section of the State, respectively. A third plot, located on muck land near Batavia, was "drowned out" early in the summer. The actual size of these plots is dependent on circumstances, amount of seed available and the problems of a specific area. Forty-two selections were grown at Bridgehampton in 15-hill plots, replicated 4 times and 15 selections were grown at Andover in 2-row plots of 15-hills (total of 30 hills-1 plot) replicated 3 times.

Some of the data collected from the third-year-yield plots at Ithaca and Riverhead as well as from the Bridgehampton and Andover plots is presented in the following table:

New York table 1. Potato yield trials.

Selection	Selection Plots								Selection
	Ithaca		Riverhead		Bridgehampton		Andover		Character
	Yld. <sup>1/</sup>	S.G. <sup>5/</sup>	Yld. <sup>2/</sup>	S.G. <sup>5/</sup>	Yld. <sup>3/</sup>	S.G. <sup>5/</sup>	Yld. <sup>4/</sup>	S.G. <sup>5/</sup>	
56N 18-4	227.9	1.073	25.2	1.067					B, <sup>6</sup>
56N 71-1	220.9	1.073	30.0	1.062	131.4	1.072			C, <sup>7</sup>
57G 3-52s	195.4	1.092	19.0	1.073	84.4	1.082			C
57G 3-58s	196.1	1.086	16.7	1.072					B,C
57G 3-82	189.8	1.085	20.9	1.069	111.0	1.082			B,C
57G 5-24	264.9	1.086	26.5	1.081	130.3	1.087			
57G 5-27s	243.7	1.080	19.9	1.080	87.6	1.082			
57G 5-159			29.7	1.073					C
57G 10-6a	251.7	1.091	24.3	1.079	118.0	1.090			B
57G 15-16	277.3	1.079	25.4	1.064	111.9	1.072			
57G 15-59s	238.3	1.090	30.6	1.078	142.6	1.088			B
57G 15-63s	212.4	1.093	27.1	1.076	126.5	1.085			B
57G 16-17	256.5	1.083	28.8	1.078	104.8	1.079			B
57G 16-78	273.7	1.080	30.8	1.068	132.1	1.077			
57G 16-83s	239.3	1.085	27.9	1.077	125.3	1.081			
B4472-4	271.7	1.083	27.2	1.075	146.4	1.085	142.0	1.091	B,GN <sup>8</sup>
B4494-3	254.5	1.099	22.9	1.080	103.2	1.096			B,C,GN
B4494-6	248.7	1.081	33.9	1.067	137.5	1.078	149.2	1.096	GN
B4523-10	187.8	1.082			115.6	1.076			B,C,GN
B4529-13	302.7	1.080	33.2	1.073	147.0	1.077			B,GN
B4537-9			36.3	1.065	184.1	1.074			B,C,GN
16V47-9	261.6	1.081	30.9	1.067					
16V48-1	230.5	1.078	20.6	1.071					
JLR-9	233.6	1.078					125.7	1.091	C S <sup>9</sup>
JLS-6	275.9	1.077	25.2	1.065			114.7	1.091	B
JLS-17	238.1	1.070	18.7	1.061					B
JSY-5	232.8	1.065							S
KBH-1	257.5	1.084					60.7	1.093	B S
KLS-13	230.4	1.069					126.1	1.088	S
KZQ-7	215.6	1.082	20.3	1.069					B
LOH-14	204.1	1.071					122.8	1.083	B,C,S
MSD-2	255.3	1.078	30.1	1.072	147.7	1.078			C,GN
NAY-10	171.2	1.077	17.0	1.073	79.6	1.074			C,GN
NBU-2a	260.9	1.081			113.5	1.080			C,GN
NBU-2c	227.2	1.080			108.4	1.081			B,GN
NES-1	287.8	1.080	26.5	1.068	140.2	1.082	148.7	1.086	B,GN
NEZ-2	269.5	1.089			112.4	1.085			GN

continued



New York table 1, continued.

NGR-6	284.5	1.085	24.1	1.074	101.5	1.081			GN
NGX-2	219.0	1.074			97.8	1.074			B,C,GN
NGX-2B	236.5	1.075	32.0	1.068	140.6	1.076	155.3	1.088	B,C,GN
NHH-2a	322.1	1.079	35.2	1.065	154.7	1.073			GN
NHH-2Y	313.2	1.078	34.3	1.064	178.6	1.073			GN
NHH-11	282.4	1.071	30.5	1.056	151.7	1.065	161.9	1.081	GN
NHH-19	309.9	1.078	28.7	1.073	134.0	1.080			B,GN
NHH-20	284.3	1.080							GN
NIF-1	250.5	1.075	29.2	1.062	133.7	1.071	139.5	1.088	C,GN
NII-2	254.6	1.083	31.5	1.075	141.6	1.080	125.4	1.094	C,GN
NIL-1	289.0	1.071			191.9	1.075			GN
NJH-6	253.4	1.088							GN
NOE-2	268.9	1.070	31.3	1.061	164.2	1.068	136.2	1.091	B,C,GN
NRR-2	279.9	1.087	24.0	1.078	91.8	1.085	120.4	1.099	C,GN
NUR-13	275.3	1.072	35.9	1.066	159.6	1.076			GN
NUR-18	239.3	1.083	28.7	1.070	112.5	1.085			GN
NUR-19	272.4	1.071			164.6	1.072			GN
NUR-20	235.8	1.081	30.3	1.072	135.9	1.082	134.6	1.095	C,GN
NUT-15	249.8	1.085	28.5	1.073	161.9	1.086			GN
NXH-3	288.5	1.076	32.7	1.069	183.8	1.073			B,C,GN
OAF-3	246.4	1.072							GN
Gr. Mt.					168.4	1.090			
Katahdin	208.3	1.079	30.5	1.064	125.2	1.073	136.6	1.086	
R. Burbank					113.9	1.081			
L.S.D. .05	32.2	.005	4.9	.007	27.3		20.8	.004	
L.S.D. .01	42.4	.007	6.4	.009	36.1				

- |   |                   |
|---|-------------------|
| <u>1/</u> Sum of 6 replications; 15 hills     | 6 Blight          |
| <u>2/</u> Average of 6 replications; 15 hills | 7 Chip            |
| <u>3/</u> Sum of 4 replications; 15 hills     | 8 Golden nematode |
| <u>4/</u> Sum of 3 replications; 30 hills     | 9 Scab            |
| <u>5/</u> Average of 3 replications           |                   |

NEW YORK (Long Island)

Richard L. Sawyer

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### Potato Variety Trials on Long Island, 1962

The 1962 potato variety trials included 34 entries planted in early April and 36 entries planted in late April. The varieties Antigo, Fundy, Blanca and Russet Burbank were included in individual spacing and fertilizer tests as a result of favorable performance in the previous year. The spacing fertilizer experiment with Russet Burbank was made in 2 locations, one on the north fork and the other on the south fork of Long Island.

Fertilization for the main variety trials was 175 pounds of nitrogen, 140 lbs. of phosphorus  $P_2O_5$ , 140 lbs. of potash as  $K_2O$  and 50 lbs. of magnesium as  $MgO$  per acre. Potatoes were harvested the first week in September for the early planting and the first week in October for the late planting.

The average summer temperatures for Long Island were the lowest they have been for many years and consequently both yields and specific gravities were favorably affected. Green Mountain and Kennebec continued to have the top yield of total U. S. No. 1 tubers followed by Ona, Marygold, Onaway, B3478-45 and Plymouth. The order was considerably different for the yield in the 2 to 3½" size. Blanca continued to produce the highest proportion of total yield in this size category.

The specific gravities were exceptionally high for Long Island this year. Many of the new entries exceeded Katahdin quality. Keswick looked much better this cool season than it has in the other years it has been tested. Fundy and Avon of the early varieties had superior quality to Cobbler and better yields. Russet Burbank, even in a cool season, does not have high specific gravity on Long Island.

For early varieties, Fundy, Avon and Keswick merit consideration. Keswick had a greater yield but a lower portion in the 2 to 3½" size. Chippewa, Plymouth and Onaway had excellent yields, however Chippewa has a low specific gravity and a large portion of the total yield of all 3 was very large. Early Gem produced very nice appearing Russet Burbank type tubers with no particular tendency to growth cracks which have normally been associated with this variety.

For late varieties, the results clearly indicate the overall superiority of Green Mountain despite the fact that this variety has practically vanished from commercial production on Long Island. Kennebec comes the closest to Green Mountain. Russet Burbank produced a large portion of its total yield in the good consumer pack size with excellent shape however the specific gravity was not particularly high. Blanca which had looked promising in the past developed an internal browning in 1961 which continued to be a problem in 1962. Unless this defect with Blanca can be circumvented, this variety has no place on Long Island. Several of the seedlings appear very promising both in appearance, yield and specific gravity and warrant continued testing. Of the newly named varieties, Marygold appeared the most outstanding and it has a pinking around the eye which lends good varietal distinction and identification.

In the Blanca spacing fertilization experiment, yield continued to increase as the spacing was increased from 8 to 12 inches between seed pieces. At each spacing yields were higher with 210 lbs. of nitrogen per acre than 175 lbs. per acre.

In the Antigo spacing and fertilizer experiment, yields were superior with the 8-inch spacing. Maximum yields for 1962 were at the 175 lbs. of nitrogen per acre level.

In the Fundy spacing fertilization experiment, as the spacing was decreased from 12 to 8 inches between seed pieces, yield was increased. At the 8-inch spacing, as the nitrogen was increased to the highest level of 210 lbs. per acre, yield was increased. This did not hold true at the other spacings.

In the Russet Burbank spacing, fertilization and seed type experiment, the closest spacing gave the best yields on both the north and south forks of the Island. At the spacing of 16 inches, there was an increase in yield as the nitrogen was increased up to 210 lbs. per acre. As the spacing was increased above 16 inches, yields tended to decrease as the nitrogen was increased from 140 to 210 lbs. per acre with the decrease most pronounced with split seed. There was a definite advantage for whole seed, however this was not as apparent at the close spacings as at the more distant spacings. An average of all spacings with split seed was 261 cwt. per acre whereas the average of all spacings with whole seed was 309 cwt. per acre. Yields were much higher on the north fork than on the south fork for this season.

Sawyer table 1. Field results from early planting of potato varieties in 1962.

Variety	Yield per acre		Specific Gravity	Remarks
	U.S. No.1	U.S.#1 2-3½"		
	Cwt.	Cwt.		
Kennebec	468	246	1.083	
Green Mountain	459	296	1.094	
Ona (B3602-4)	414	216	1.077	
Marygold	394	278	1.084	Pink eyes, yellow flesh
Onaway	389	182	1.076	
B3487-45	378	270	1.081	Deep eyes
Plymouth	363	184	1.080	Large size variation, uniform shape
Chippewa	361	237	1.070	
A 929	361	173	1.078	
LaSalle	360	232	1.076	
Alleghanna	356	128	1.068	Irregular
Katahdin	348	160	1.073	
I 111-5	338	196	1.077	Nice shape, uniform
B3353-9	335	271	1.071	Smooth skin, shallow eye
B4123-10	329	244	1.068	
Keswick	328	136	1.086	
Blanca	328	298	1.088	Very uniform size and shape
B3725-1	309	206	1.070	Some second growth
Fundy	307	196	1.082	
Avon	306	193	1.082	Deep bud end
B751-119	304	230	1.080	
Russet Burbank	304	258	1.075	Some knobs
B4159-2	291	278	1.079	Small size, uniform shape
Cobbler	289	249	1.079	
B3563-2	280	210	1.087	

continued



Sawyer table 1, continued.

Early Gem	270	212	1.071	
B331-7	264	237	1.073	Small size
Snowflake	262	205	1.076	Growth cracks
Arenac	261	195	1.088	
47156	259	167	1.084	Yellow flesh, skins easily
Nordak	255	184	1.069	Growth cracks
I 111-8	249	205	1.087	Uniform, nice shape
Norgleam	238	151	1.068	Yellow flesh, smooth skin
Haig	224	211	1.072	Nice shape, uniform

Sawyer table 2. Effect of spacing and nitrogen fertilization on Blanca, Antigo and Fundy. Yield U. S. No. 1 per acre.

Nitrogen per acre	Spacing in inches		
	8"	10"	12"
	Cwt.	Cwt.	Cwt.
<u>Blanca</u>			
175	327	321	360
210	337	343	373
<u>Antigo</u>			
140	293	246	
175	332	297	
210	310	304	
<u>Fundy</u>			
140	310	266	291
175	324	290	288
220	325	280	305

Sawyer table 3. Effect of spacing and nitrogen fertilization on Russet Burbank. Yield U. S. No. 1 per acre.

Nitrogen per acre	Spacing in inches			
	16"	20"	24"	30"
	Cwt.	Cwt.	Cwt.	Cwt.
lbs.				
140	290	320	286	248
175	292	312	306	229
210	327	290	278	212

Field results for Sawyer table 4 were given in the 32nd Annual Report to Cooperators. Storage data was taken at the end of 5 months. All samples were stored at 50° F. except black spot material which was stored at 40° F.

Specific gravity determinations were made with the potato hydrometer. Black spot index was derived from per cent of tubers showing black spot after bruising and peeling and the average severity of the black spots. The severity rating was from 0 (none) to 9 (severe). The index came from the formula  $\frac{\% \text{ black } \times \text{ severity rating}}{10}$ .

Chipping index was based on the color chart from the National Potato Chip Institute with 10 indicating very dark chips and 1 very light chips. Potatoes were boiled and rated 1 through 9 for color and mealiness. A rating of 9 indicated lightest color and most mealiness. Potatoes were boiled for 30 minutes and allowed to stand in air for 30 minutes for color readings.

Sawyer table 4. Storage and cooking results from the 1961 variety trial listed in order of field yield from low to high.

Variety	Specific gravity	Blackspot index	Shrink- age Pct.	Grams/Sprout per kilo tuber	Chipping index	Internal browning	Cooking color	Cooking texture
Norland	1.063	1	9.4	26	7.6	2	4.0	3.6
Haig	1.068	3	8.1	19	8.6	0	5.2	3.0
Fundy	1.071	5	5.3	8	7.8	7	5.2	5.0
Cobbler	1.068	2	5.0	7	7.9	0	5.2	4.4
Katahdin	1.066	3	5.5	7	8.0	2	4.4	4.8
Antigo	1.067	1	4.2	4	7.8	7	4.8	3.4
Onaway	1.062	7	5.0	4	9.5	1	5.2	5.0
Blanca	1.078	16	7.5	5	8.6	12	5.8	4.6
Chippewa	1.061	2	6.5	9	8.9	0	6.6	3.6
Plymouth	1.071	12	6.8	8	8.2	0	4.6	3.8
Excel	1.077	8	5.7	8	8.4	0	4.8	5.0
Pungo	1.071	14	8.4	19	9.3	1	4.2	3.4
Avon	1.073	6	7.3	11	6.9	2	5.0	4.2
Red Pontiac	1.060	3	8.7	14	9.4	2	4.4	3.6
B69-16	1.073	5	5.2	3	8.9	0	5.0	4.6
Kennebec	1.078	12	6.9	7	8.2	1	5.0	5.8
Green Mountain	1.084	9	6.4	6	8.8	3	4.8	5.6
B3696-13	1.073	21	9.0	13	9.0	2	5.2	3.4
L.S.D. 5%	.005	5	8.0	3	1.9		.8	.8

## NORTH DAKOTA

R. H. Johansen, E. P. Lana, C. A. Nelson and A. P. Benson

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The problem, objectives and plan of work in potato breeding for North Dakota are similar to those reported in the 1951 report.

### Potato Crossing Program

One hundred and ninety-five crosses were made in the greenhouse during 1962. The objective of most crosses was to combine good tuber type, red color, high yield, good processing qualities and high specific gravity with disease resistance. Parental material from the USDA and other cooperating states was used extensively in the breeding program.

### Greenhouse and field seedlings

Approximately 27,000 seedlings representing 300 families were grown in the greenhouse during the summer and fall of 1962. Seedlings were transplanted into greenhouse benches during July and August and harvested during November and December.

Since 1950, the first year field seedlings have been planted at the Langdon Experiment Station, Langdon, North Dakota. However, in 1962 due to wet field conditions and a late spring, it was necessary to plant the seedlings at another station. The other station chosen for this purpose was the Agronomy Seed Farm located at Casselton, North Dakota where the seedlings were planted on June 6 and 11. According to past records, June 11 was the latest seedlings have ever been planted in North Dakota.

Conditions at Casselton were quite favorable at planting time in June. Later in the season or during late June and July, excessive rainfall occurred which caused severe flooding and damage to many of the seedling families. The heavy rain prior to harvest along with the water soaked, finer textured soils at Casselton made conditions quite unfavorable at harvest.

In the field at harvest, approximately 600 clones were selected for further study and increase. Interspecific crosses of seedling families involving Solanum tuberosum x Salinum acaule were obtained from the Horticulture Department, Louisiana State University and were planted at Grand Forks. Some of these seedling families were first generation hybrids between S. tuberosum and S. acaule while others were back crosses and intercrossees involving S. tuberosum and S. acaule. Several clones having frost resistance were selected at harvest. Further work of this nature and other work involving the exchange and testing of breeding lines and families will be continued in cooperation with the Horticulture Department, Louisiana State University.

### Advanced Selections

Wet field conditions in the spring at Langdon also made it necessary to plant the advanced selections at Casselton during 1962. Three hundred greenhouse indexed third-year and older advanced selections and 427 second-year selections were planted under isolation. Seed stocks harvested from these plots will be indexed in the greenhouse during 1962-1963 to be used for further increase and testing. In addition to the increase plot at Casselton, duplicate planting of



all selections was made at Grand Forks. The object of the Grand Forks planting was to test all selections for scab and silver scurf resistance and for general adaptability.

Application for certified seed was made on 23 promising selections. The field inspections were made by the North Dakota State Seed Department who in addition to the regular inspections of the fields also assisted with the roguing of diseased plants.

The distribution of the white selection ND 3022-18 to a foundation seed grower at Beach, North Dakota was the only advanced selection to be distributed for growers increase in 1962.

The usual testing of advanced selections in Florida and Alabama was again carried out in cooperation with the North Dakota State Seed Department.

A summary of selections and seedlings grown and saved for further study follows:

<u>Year</u>	<u>No. planted</u>	<u>No. saved</u>
1st year field seedlings	20,251	600
ND 2nd year	457	104
ND 3rd year	199	59
ND 4th year	51	13
ND 5th year and older	45	29

Two hundred and twenty-four USDA selections were tested for scab resistance and general adaptability at Grand Forks. Selections saved from this planting will be tested and increased for further use as parental stock.

### Variety Trials

#### A. Statewide variety trials

Replicated variety trials were grown at Grand Forks, Park River, Minot and with and without irrigation at Williston. Trials at the Experiment Station located at Minot and Williston were conducted by G. N. Geiszler and G. Kapusta while at Park River and Grand Forks R. Amstrup and H. Earl were in charge of the general maintenance of their respective trials. Excessive spring rainfall at Fargo made it impossible to plant a variety trial at this location during 1962.

The varieties were grown in plots of 25 hills and replicated four times in a randomized block. Fifteen varieties and selections were grown at Williston and Minot while twenty varieties and selections were grown at Grand Forks and Park River. Tubers from all plots were harvested and weighed to obtain total and marketable yield. Marketable yield consisted of all tubers of U. S. No. 1 quality over 2 inches in diameter. Specific gravity determinations were made by the use of the potato hydrometer.

Spacing, fertilizer, soil type, planting date and harvest date of each location follows:

Location	Spacing		Fertilizer applied	Soil type	Planting date	Harvest date
	Row	Plants				
Grand Forks	38"	12"	400#/A 16-16-8	Bearden clay loam	5/18	9/25
Park River	38"	12"	400#/A 16-16-8	Glyndon silt loam	5/28	9/20
Minot	42"	14"	none	Loam	5/18	9/15
Williston - irrigation	38"	15"	100#/A 16-48-0 100#/A 33-0-0 side dressed	Silty clay loam	5/18	9/14
Williston - dryland	42"	15"	100#/A 16-48-0	Williams loam	5/18	9/14

The 1963 season was generally quite cool and wet at planting and during most part of the growing season. For example, at Grand Forks the mean temperature during May was 54.3° F. with 6.52 inches of precipitation. This was followed by a somewhat dry period during the growing season but still below normal mean temperatures. In general, the cool wet season was quite favorable for potato production in North Dakota.

In comparing the 1962 and the 1961 seasons, the total and U. S. No. 1 yields were higher in 1962 at all locations except Minot and Park River. Apparently a dry period occurring at Park River during a critical time was responsible for the lower yields. The lower yields at Minot may also be attributed to a similar situation where ample moisture was present from May through July, followed by a dry period from August until the vines were killed by frost on September 4.

The highest yielding entries in the 1962 trials were Red Pontiac, Kennebec, Red LaSoda, ND 3815-1R and Cobbler (ND table No. 1). All of these entries produced an average yield of over 175 cwt. per acre. For the past several years these four varieties and the selection ND 3815-1R have consistently been the highest yielding entries in trial. The consistently high yielding ability of Red Pontiac and Red LaSoda along with the good red skin color has been the outstanding characteristic that has made these varieties popular with North Dakota growers.

Other selections producing satisfactory yields at all locations were ND 4524-7R and ND 4121-25. In comparing the two sister selections, ND 4524-7R and ND 4524-16R, the former produced higher yields and smoother shaped tubers but the specific gravity was slightly lower. The intensive red skin color, good tuber type, late blight and scab resistance offers a great varietal potential for these two selections. This is especially true for ND 4524-7R.

Selection ND 3815-1R, a high-yielding red, has been found to be quite well adapted to most areas of North Dakota. Under some conditions, ND 3815-1R has the tendency to produce jumbo or oversize tubers and because of this characteristic, certain cultural practices such as spacing, time of planting, etc. will be needed to grow this selection satisfactorily. Proper time of vine killing will be especially important to control tuber size, smoothness and second growth. Although ND 3815-1R is no real eye catcher, it has many outstanding characteristics such as excellent culinary qualities, moderate scab resistance, drought resistance and tolerance to adverse weather conditions. This selection has extremely white flesh and is excellent for boiling and baking. It will be named sometime in 1963 (proposed name--Viking).



Among the russet-skinned entries, ND 4192-3 was again outstanding in tuber type and general appearance. In the trials at Park River and Grand Forks, this selection outyielded the russet-skinned entries, Russet Burbank, Early Gem, ND 3676-20 and ND 3740-11. This selection should offer an outstanding russet-skinned variety that will be adapted to most potato growing areas of North Dakota and should be popular both as a table and seed stock variety.

Selection ND 4192-3 was released to several foundation potato growers in 1960. Unfortunately, some of the lots distributed were infected with the spindle tuber virus and had to be destroyed. Of the original seed distributed, four lots were found to be free of spindle tuber by the North Dakota State Seed Department. These lots now make up the source of foundation seed. The work by the North Dakota State Seed Department along with the conscientious work of the foundation potato growers made it possible to have an increase of approximately 30 acres of certified ND 4192-3 during 1962.

In comparing yields of early maturing varieties, Norland and Snowflake produced yields slightly lower than Cobbler. However, the quality and general appearance of Norland and Snowflake was much better than Cobbler. Norland looked especially good in the 1962 trials.

Although the yields of ND 3022-18 and ND 4122-2 were only fair, the tuber type was found to be excellent. Because of the sporadic occurrence of heat necrosis found in ND 4122-2 and ND 3022-18, the future of these two selections still remains uncertain. Both of these selections have one common parent, ND 457-1. ND 457-1 has been an outstanding parent with good field resistance to virus Y; however, it is quite susceptible to heat necrosis and apparently this is transmitted to its progeny.

The selections ND 3676-20, ND 4632-9, ND 4289-15R and ND 4286-11R did not look promising in the 1962 trials and these selections will probably be discarded in 1963.

The irrigated trial at Williston produced an average of 119 cwt per acre more than the non-irrigated trial. The yield difference of irrigated over non-irrigated was not as great during 1962 and no doubt, higher seasonal rainfall was responsible for the higher yields in the non-irrigated trial.

Specific gravity or total solids was very high in 1962 (ND table 2). All varieties and selections produced an average total solids of over 21% when grown at all locations. ND 4122-2, Russet Burbank, Kennebec, Cobbler and ND 4524-16R produced an average per cent total solids that ranged from 23.5 to 23.1. Only 2 entries, ND 4632-9 grown at Grand Forks, and Early Gem, grown at Park River, produced total solids below 20%.

Neither russet nor common scab were serious problems on any variety or selection grown in trial during 1962. However, Norland, ND 4122-2, ND 4192-3, Early Gem, ND 3740-11, Russet Burbank, ND 3676-20 and ND 4524-7R all showed a very low incidence of scab. The selections ND 3815-1R, ND 4286-11R and ND 3022-18 and the variety Red LaSoda showed only moderate amounts of superficial type scab. The highest incidence of scab was found on the varieties Red Pontiac, Kennebec and Snowflake. Silver scurf was again quite common on several varieties and selections.



Although late blight was found in commercial fields during 1962, no late blight was found on varieties and selections grown in the replicated trials.

#### B. Red Trial

Sixteen varieties and selections were grown in the Red Trial at Grand Forks in 1962 (ND table 3). Plot design of this trial was similar to that of the state-wide trials. The highest yielding entry in this trial was ND 4468-1R with a yield of 281 cwt. per acre. Although this selection has good yielding ability, it is lacking in table quality and general appearance and seems to be very susceptible to the virus causing spindle tuber. The yield of ND 3815-1R was significantly higher than Red LaSoda but not Red Pontiac at the 5% level of significance. In this trial, little differences in yield were found between the sister selections ND 4524-7R and ND 4524-16R. Erli-red was again the lowest yielding entry in the red trial. ND 4524-16R and ND 4583-14R produced the highest percent total solids while Red Pontiac produced the lowest. Norland and Erli-red were the earliest maturing varieties while Red Pontiac was the latest maturing variety.

#### C. North Central Regional Trial

Twenty selections and varieties were grown in the North Central Regional trial in 1962. Entries in trial were obtained from North Dakota, Wisconsin, Nebraska, Louisiana, Michigan, USDA and grown in trial in Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio and Wisconsin. Results of these trials are published in the National Potato Breeding Program for 1962.

In the regional trial grown at Grand Forks, North Dakota, the selections ND 4192-3, ND 4524-7R, La 62-162, ND 3815-1R, Wisc. 56, TL 6894, La 61-125, B3602-4, Mich. 425-2L and Norland appeared to be the most promising.

#### Virus Y Studies

Cage screening of potato clones was continued with results similar to that of previous years. All commercial varieties tested were found to be susceptible to virus Y. Clones which did not show virus Y symptoms were carried over to be tested again.

To attempt to develop inbred lines homozygous for virus Y, crosses were made in the greenhouse in 1961-62. Selections will be made on the basis of pollen fertility of the individual clones. These highly fertile clones will be tested for Y symptoms.

North Dakota table 1. Marketable yield and percent U.S. No. 1 of varieties and selections grown in State-wide potato variety trials, 1962.

Variety	Grand Forks		Park River		Minot		Williston		Average	
	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.	Cwt.	Pct.
Red Pontiac	216	96	196	90	126	84	152	92	281	94
Kennebec	259	95	182	92	99	80	148	95	245	94
Red LaSoda	211	82	162	88	114	85	165	95	272	96
ND 3815-1R	241	85	167	88	101	88	141	97	238	96
Cobbler	212	93	128	83	114	88	133	89	293	94
ND 4524-7R	210	91	142	83	84	83	151	94	222	94
ND 4121-25	218	93	101	86	101	86	140	93	238	94
ND 3740-11 Russ	174	72	115	71	89	77	120	91	291	96
Norland	164	90	156	86	101	81	124	88	228	94
4192-3 Russ	188	89	126	82	81	69	102	86	238	93
Snowflake	161	90	125	89	83	75	119	94	227	96
4524-16R	154	90	137	87	72	74	97	92	257	95
4122-2	156	87	118	80	90	79	134	88	212	93
Russ Burbank	115	63	101	69	68	67	106	87	227	93
3676-20 Russ	120	79	78	75	62	70	72	77	221	95
ND 4286-11R	176	87	154	76						
ND 4289-15R	184	91	145	90						
ND 3022-18	195	97	117	90						
ND 4632-9	165	92	103	86						
Early Gem	121	69	100	70						
	182		133		92		127		246	
L.S.D. .05	31		27		26		27		48 cwt	
	41		36		35		36		64 cwt	
1/ Average at 5 locations										
2/ Average at 2 locations										

North Dakota table 2. Specific gravity and total solids of varieties and selections grown in State-Wide potato variety trials, 1962.

Variety	Grand Forks		Park River		Minot		Dryland		Williston		Average Sp.Gr.Solids		
	Sp.Gr.	T.Solids	Sp.Gr.	T.Solids	Sp.Gr.	T.Solids	Sp.Gr.	T.Solids	Sp.Gr.	T.Solids			
ND 4122-2	1.098	23.5	1.093	22.4	1.097	23.4	1.102	23.4	1.098	23.6	1/	1.098	23.5
Russet Burbank	1.094	22.7	1.091	22.1	1.100	24.0	1.102	24.4	1.097	23.4		1.097	23.4
Kennebec	1.096	23.1	1.088	21.4	1.098	23.6	1.102	24.4	1.096	23.1		1.096	23.1
Cobbler	1.097	23.4	1.093	22.4	1.095	22.9	1.099	23.7	1.096	23.1		1.096	23.1
ND 4524-16R	1.097	23.4	1.094	22.7	1.096	23.1	1.096	23.1	1.098	23.6		1.096	23.1
ND 4192-3 Russ	1.092	22.2	1.093	22.4	1.096	23.1	1.096	23.1	1.098	23.6		1.095	22.9
Snowflake	1.089	21.6	1.093	22.4	1.098	23.6	1.094	22.7	1.096	23.1		1.094	22.7
ND 3815-1R	1.092	22.2	1.090	21.9	1.096	23.1	1.096	23.1	1.092	22.2		1.093	22.4
ND 3676-20 Russ	1.096	23.1	1.090	21.9	1.098	23.6	1.090	21.9	1.092	22.2		1.093	22.4
ND 4121-25	1.092	22.2	1.092	22.2	1.091	22.1	1.091	22.1	1.094	22.7		1.092	22.2
Red LaSoda	1.091	22.1	1.084	20.6	1.097	23.4	1.097	23.4	1.093	22.4		1.092	22.2
ND 3740-11 Russ	1.087	21.2	1.085	20.7	1.090	21.9	1.091	22.1	1.091	22.1		1.089	21.6
ND 4524-7R	1.094	22.7	1.083	20.4	1.088	21.4	1.088	21.4	1.088	21.4		1.088	21.4
Red Pontiac	1.088	21.4	1.082	20.1	1.084	20.6	1.092	22.2	1.088	21.4		1.087	21.2
Norland	1.087	21.2	1.083	20.4	1.088	21.4	1.084	20.6	1.086	21.0	2/	1.086	21.0
ND 4289-15R	1.096	23.1	1.094	22.7								1.095	22.9
ND 3022-18	1.095	22.9	1.092	22.2								1.094	22.7
ND 4286-11R	1.093	22.4	1.093	22.4								1.093	22.4
Early Gem	1.081	19.9	1.082	20.1								1.082	20.1
ND 4632-9	1.084	20.6	1.080	19.7								1.082	20.1
Average	1.092	22.2	1.089	21.6	1.094	22.7	1.095	22.9	1.094	22.7		1.092	22.2
L.S.D. 5%	.004		.004		.005		.005		.004				
L.S.D. 1%	.005		.005		.006		.006		.005				
1/ Average at 5 locations													
2/ Average at 2 locations													



North Dakota table 3. Red skinned potato variety trial marketable yield, percent U. S. No. 1, total solids, and specific gravity of varieties and selections grown at Grand Forks, 1962.

Variety	Marketable Yield	U.S. No. 1	Specific Gravity	Total Solids
	Per Acre			
	Cwt.	Pct.		Pct.
ND 4468-1R	281	93	1.092	22.2
ND 3815-1R	268	90	88	21.4
Red Pontiac	234	92	84	20.5
Red LaSoda	224	83	87	21.2
Norland	219	92	86	21.0
ND 4524-4R	217	92	95	22.9
ND 4650-7R	209	89	91	22.0
ND 4289-14R	207	93	87	21.2
ND 4583-14R	206	91	98	23.5
ND 4524-7R	201	84	90	21.8
ND 4524-16R	199	88	98	23.5
ND 4289-15R	192	90	98	23.5
ND 4559-6R	183	91	94	22.7
ND 4286-11R	183	85	96	23.1
ND 4620-1R	176	78	97	23.3
Erlired	127	88	89	21.6
Average	208	89%	1.092	22.2
L.S.D. 5%	42		.004	
L.S.D. 1%	56		.005	

OHIO

J. P. Slesman

The research program attempting to develop varieties which combine insect resistance with resistance to leaf blight diseases (early and late blights) was continued in 1962. The growing season was characterized by cool, dry weather. Potato leafhopper populations were higher than normal and unsprayed susceptible varieties were severely injured. Potato flea beetle populations were relatively light and aphids were of little importance. A single application of the systemic insecticide Thimet or Di-Syston, applied at the rate of 3 pounds actual toxicant to the soil in a band on either side of the row, gave season-long control of the potato leafhopper, flea beetle adults and larvae, and aphids up to mid-season. Late blight was not observed in any of the plots and early blight was of minor importance. Materials used in this study were provided by Mr. Akeley, Mr. Ross, and Dr. Hougas.

The search for new sources of leafhopper resistance in *Solanum* species involved a study of 186 species introductions, many of which were either free of leafhoppers or tolerant of this insect, supporting a sizeable leafhopper population without showing appreciable hopperburn injury. Among the leafhopper-free species were berthaulti, brachycarpum, bulbocastanum, chacoense, demissum, pinnatisectum, polyadenium, sparsipilum, and tarijense. Species that were tolerant of the leafhopper included fendleri, simplicifolium, stoloniferum, and andigena. Eleven of the 38 variants of andigena studied exhibited a high degree of tolerance, being relatively heavily populated with leafhopper nymphs but showing little hopperburn injury.

The species varied greatly in the amount of adult flea beetle feeding on the leaves, a criterion which is used as an index to the degree of resistance exhibited by varieties and species of potato to this insect. The number of adult flea beetle feeding punctures ranged from zero to 114 per leaflet. Species that were highly resistant to this insect were berthaulti, bulbocastanum, jamesi, polyadenium, stoloniferum, and tarijense.

Ninety F<sub>1</sub> hybrids resulting from crosses between species and tuberosum were grown and evaluated for resistance to the potato leafhopper and the potato flea beetle. Leafhopper populations varied from 0.1 to 3.6 nymphs per leaf and all of them showed relatively heavy hopperburn injury. Adult flea beetle feeding was severe on all hybrids, none showing even a moderate degree of resistance to this insect.

Twenty-six seedling selections which are highly resistant to early and late blight were evaluated for susceptibility to leafhoppers and flea beetles. Leafhopper populations of the seedlings varied from 0.01 to 3.04 nymphs per leaf compared with 6.0 nymphs for the susceptible Irish Cobbler variety. Seedling B3948-5, selected from the progeny of a cross between Earlane and Ac. 25976, was the most resistant to the potato leafhopper and showed the least amount of hopperburn injury. All of the seedlings were rated as being susceptible to the potato flea beetle.

Seventeen seedlings found to be resistant to late blight by John Neiderhauser in tests conducted in Mexico were planted at Wooster and evaluated for resistance to insects. Leafhopper populations ranged from 0.4 to 2.0 nymphs per leaf for the seedlings and 6.0 for Irish Cobbler. Most resistant were seedlings 136-6, Ac. No. 26079 (B729 x B3716) and Ac. No. 26103 (B3516 x B3716), the last two selections showing little or no hopperburn injury. All seedlings were as heavily

damaged by the potato flea beetle as was Irish Cobbler.

Approximately 500 seedlings representing 5 unselected progenies from crosses between disease and insect resistant parents were studied at Wooster. The data summarized in Ohio table 1 show that all of the progenies segregated for resistance to hopperburn injury, some of the seedlings falling into each of the 5 classes of hopperburn. Progeny B 5515 (parentage B 3955 x Merrimack) contained the highest number of resistant seedlings, followed by B 5516 (parentage B 3955-2 x Saco) and B 5526 (parentage B 3955 x (X96-56)). As the season progressed, there was considerable shifting in the position of the seedlings with respect to hopperburn. Many of the seedlings that showed a low order of hopperburn on July 18 were heavily damaged by the leafhopper when rated on October 9. As the plants approach maturity and the population pressure becomes greater, the number of leafhopper nymphs per leaf generally increases and hopperburn injury becomes more severe. At the end of the season, however, about 10 percent of the seedlings were free from hopperburn injury.

The data summarized in Ohio table 2 show that some of the seedlings are tolerant of the leafhopper, supporting a fairly high nymphal population without being appreciably injured by hopperburn. Seedlings with a comparatively low leafhopper population of 0.2 nymphs per leaf placed in each of the 5 classes of hopperburn injury. This was true also for 5 different leafhopper population levels ranging from 0.4 to 1.5 nymphs per leaf. When a group of seedlings growing in the field were exposed to the same leafhopper population level, some were completely destroyed; whereas others showed little, if any, hopperburn injury.

Ohio table 1. Seedlings in various progenies segregate for resistance to hopperburn injury. Wooster, Ohio. 1962.

Pedigree Number	Date	Seedlings in each class of hopperburn <sup>1/</sup>				
		1	2	2	4	5
		No.	No.	No.	No.	No.
B 5435	7/18	4	9	3	2	1
B 5435	10/9	0	4	3	8	3
B 5495	7/18	2	10	16	9	2
B 5495	10/9	1	1	0	0	41
B 5526	7/18	12	43	22	17	11
B 5526	10/9	6	8	8	12	62
B 5516	7/18	4	83	76	38	15
B 5516	10/9	3	26	39	39	107
B 5515	7/18	40	68	19	1	0
B 5515	10/9	45	29	12	4	31

<sup>1/</sup> Classes of hopperburn: 1, none; 2, trace; 3, light; 4, medium; 5, heavy.



Ohio table 2. Tolerance to leafhoppers in potatoes as shown by variations in degree of hopperburn among groups of seedlings with different population levels. Wooster, Ohio, 1962.

Leafhopper nymphs per leaf	Seedlings in each class of hopperburn <sup>1/</sup>				
	1	2	3	4	5
No.	No.	No.	No.	No.	No.
0.2	16	21	18	5	5
.4	7	31	13	6	1
.6	7	22	10	8	8
.8	2	20	9	7	3
1.0	3	29	31	11	2
1.5	3	16	28	16	5
2.0	0	21	14	9	4
3.0	0	3	4	5	4
4.0	0	2	3	3	2

<sup>1/</sup> See footnote Ohio table 1.

OHIO (Columbiana County)  
Floyd Lower  
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The purpose of the test is to find new varieties suitable for chipping and also for table stock which are adapted to this area.

Seed of the new varieties was furnished by Experiment Stations and for the standard varieties by local growers. The cut seed was treated with dry Captan. Thirty varieties were used part of which were planted on each of 4 farms. In most cases 5-pound lots of seed were used. There were no replications on each farm. The regular cultural practices on each farm were followed. Fertilization consisted of applying 800 to 1500 pounds of a complete fertilizer in a row, usually 8-16-16. In some cases additional nitrogen was plowed down. The rows were 33 to 35 inches apart with the plants 7 to 9 inches in the row. The regular spray schedules with insecticides and fungicides were used. The field on the Thompson' farm was irrigated 3 times.

The season was quite dry beginning early in the spring. However, yields were good excepting on the Barth' farm, where the potatoes suffered mostly from drought. Little disease was present.

The soil was mostly Wooster Silt Loam except on the Barth Farm, which was a heavier type, probably Canfield Silt Loam. Good practices were used on each farm. Planting dates follow--Thompson Farm, April 30; Barth Farm, May 8; Reash Farm, May 22; Tritten Bros., June 4.

The following varieties, listed in order of maturity, give the most promise for this area--Snowflake, LaChipper, Superior, Avon, LaSalle, Ona, and possibly Fundy, Plymouth, Ag. 56, Teton, and Potomac. Kennebec and Katahdin remain two of the best varieties in this area.

Yields in Ohio table 3 are on the basis of total production of field-run potatoes and not on a marketable basis. Another test for chip color will be made in February. The Coughlin chart was used for chip color ratings.

Ohio table 3. Potato variety tests, Columbiana County, Ohio, 1962.

Variety	Yield		Th.	Tr.	R.	Av.	Specific gravity	Chip Color			
	B.	Cwt.						Oct.4		Dec.11	
								B	Th.	B.	Th.
<u>Very Early</u>											
Red Warba (red)	157.8		249.6				1.074	5		7	
Snowflake	180.0		325.8				1.071	4	5	4	5
<u>Early</u>											
Fundy	156.0		301.2	199.2	228.6	221.4	1.078	6		4	
La Chipper	193.8		456.0	249.0	388.8	322.2	1.076	4	4	2	2
Superior	187.2		385.2	288.6	331.8	298.2	1.074	5	4	3	2
Arenac (1111-8)	157.8		282.6	208.2			1.077	4		3	
Cobbler	172.2		261.6	183.6	279.6	225.6	1.070	5	6	4	5
LaRouge (red)	175.8		389.2				1.073	6		5	
Ag. 234			174.6	232.8			1.070		3		3
Catoosa (red)			392.4				1.064		7		5

continued

Ohio table 3, continued.

<u>Early Mid-season</u>	B.	Th.	Tr.	R.	Av.		B	Th.	B.	Th.
Plymouth	186.0	349.2	321.0	335.4	298.2	1.080	4		3	
Ag. 56	157.8	391.8	336.0	348.6	308.4	1.082	5	5	4	4
Avon	162.0	433.8	301.2	320.4	304.2	1.075	5		3	
Allehanna	204.0					1.071	4		4	
Iowa 801-10		308.4				1.087		5		2
B3570-5			257.4							
<u>Mid-season</u>										
Teton	330.0	414.0				1.074	4		4	
Bounty (red)	229.8	453.0	335.4	324.6	336.0	1.074	5		7	
WY 1122			357.6							
B 3563-2			392.4							
LaSalle		358.8	368.4			1.085		4		3
Kennebec			414.0			1.085		3		2
Katahdin	230.4	363.0	332.4	330.6	314.4	1.073	4		4	
Delus	166.2	322.8	400.2	423.6	328.2	1.078	5		4	
B751-119			283.8							
Ona (B3602-4)		369.0	473.4			1.073		5		3
<u>Late</u>										
Russet Sebago	157.8		354.6			1.068	5		4	
Russet Rural	160.2	391.8	445.8	300.0	324.6	1.070	5		4	
<u>Very Late</u>										
47156			347.4							
Potomac	112.2	486.6	439.8	389.4	357.0	1.070	7	5	8	7

B = Barth  
 Th = Thompson  
 Tr = Tritten  
 R = Reash



PENNSYLVANIA

J. D. Harrington and F. J. McArdle

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Variety yield trials were conducted at the Department of Agronomy Research Farm near Centre Hall in Centre County, Pennsylvania.

At the experimental site variety tests followed a fall-plowed red clover sod. The soil type is identified as a Hagerstown silt loam. Soil characteristics are as follows: pH-6.6; high fertility; 2.4% organic matter; moderately deep; and well-drained.

Prior to planting, rows were furrowed out to a depth of approximately 4-inches, and simultaneously 2000 pounds per acre of 5-10-10 fertilizer was banded in the row.

A randomized block design with five replications for each of the three maturity groups was employed. Seedpieces of potato seedlings and varieties were hand-planted April 30, May 1, and 2 nine-inches apart within each 30-foot single row plot, with a three-foot open break between plots. A distance of 36 inches between rows was employed.

Pre-emergence weed killer, hand weeding and two hilling operations were performed. A normal insecticidal and fungicidal spray program was maintained. Use of a chemical top-killer was not employed. Vegetative tops of plants were roto-beat approximately seven days before harvest.

Early and midseason seedlings and varieties were harvested October 2 or 154 days after planting. Chipping indices were performed October 5. Late varieties were harvested October 25, or 176 days after planting and chipped November 5.

Cool, extremely dry weather prevailed through most of the growing season. Until September, or during the first 4 months of the season only 6.24 inches of rainfall was recorded at the experimental site.

Specific gravity determinations were made on composite samples, selected during the grading process, by employing a potato hydrometer. Readings were converted to total solids by employing the table prepared by Behrend, Maercker and Morgen. Chip yield was determined on duplicate one-half pound samples of peeled potatoes. Gardner Rd color values were determined against Gardner color standard #C-LY-1047-57. Chip color with Rd values of 20.0 and above are considered marketable.

Results of varietal performance trials are presented in Pennsylvania table 1.

Pennsylvania table 1. Tuber yields and chipping indices of potato varieties and seedlings produced in Centre County, 1962.

				CHIP INDICES		
Variety or Seedling	Seed Source	U.S. No. 1 Yields per acre		Solids	Yield Lbs. per 100 lbs.	Color Rd
				Cwt.	Pct.	Pct.
Early to medium-early maturity <sup>1/</sup>						
Pungo	Me.	105	83	20.1	30.6	30.2
Catoosa	Wis.	98	82	18.3	28.9	33.5
Onaway	USDA	92	80	19.5	28.2	28.9
F 4613	USDA	79	77	20.1	28.4	30.7
B 137-5	USDA	75	71	20.1	31.9	28.7
Superior	USDA	75	79	21.0	30.6	29.5
Cherokee	USDA	70	65	21.8	30.8	33.1
Rushmore	USDA	65	62	19.4	29.1	30.2
Norgleam	USDA	61	72	20.1	31.9	27.2
4 SL-2	Pa.	60	73	21.8	28.9	31.5
Nordak	USDA	59	72	20.8	30.4	29.3
Cobbler	Me.	57	56	21.6	31.3	35.6
Tawa	USDA	56	69	20.8	32.4	30.1
Fundy	USDA	55	64	21.8	30.2	31.2
Earlaine	USDA	54	58	19.9	30.0	29.3
F 5025	USDA	46	50	22.6	31.7	29.1
Snowflake	USDA	45	58	21.0	32.2	28.9
B 607-56	USDA	42	49	18.3	28.4	29.9
T L 6937	N.D.	42	56	20.6	30.6	31.7
X 1276-185	USDA	38	38	20.1	29.7	31.3
Avon	Me.	38	53	21.0	30.2	35.2
B 3726-6	USDA	34	48	23.6	32.4	29.1
Dazoc	USDA	34	43	20.3	27.3	30.4
B 579-3	USDA	31	61	21.6	33.3	31.5
B 4159-2	USDA	27	35	21.7	29.1	29.5
B 3427-7	USDA	20	31	20.9	29.7	27.9
B 3725-1	USDA	19	35	20.9	30.4	29.5
L.S.D. .05		10				
Midseason maturity <sup>1/</sup>						
Bounty	USDA	102	76	18.2	30.0	23.5
Allehanna	Pa.	90	78	18.7	28.9	31.1
B 73-3	USDA	89	82	21.1	33.0	30.7
Chippewa	USDA	71	65	19.5	29.3	33.1
Arenac	USDA	69	67	19.8	31.1	22.2
Blanca	USDA	54	51	19.7	30.2	30.0
Navajo	USDA	45	58	20.3	30.8	28.1
Plymouth	Me.	41	53	19.9	28.9	31.3
L.S.D. .05		11				

continued

Pennsylvania table 1, continued.

Medium-late to late maturity <sup>2/</sup>						
Green Mountain	USDA	237	92	18.6	13.1	17.8
Russet Rural	USDA	233	90	17.1	29.3	17.8
4 QV-30	Pa.	193	91	16.3	27.1	24.8
Merrimack	USDA	184	93	18.1	29.5	22.4
Ontario	USDA	175	82	15.2	28.6	16.3
Redskin	USDA	168	94	17.0	27.8	14.6
Katahdin	Pa.	154	85	15.5	28.9	24.5
Huron	USDA	150	87	18.6	29.1	22.0
B 3352-8	USDA	141	80	15.9	29.5	21.3
Red Pontiac	Me.	139	89	17.2	28.9	16.3
Delus	USDA	137	94	20.6	31.3	23.6
Saranac	USDA	136	73	15.0	26.4	11.1
Kennebec	Pa.	132	90	17.8	28.9	29.5
Ona	Me.	132	83	18.4	29.7	26.0
Sebago	Me.	131	83	17.1	29.1	27.3
Excel	USDA	127	80	22.3	31.9	29.5
Golden Chip	USDA	121	88	17.1	28.4	29.7
Emmet	USDA	119	85	18.5	30.2	20.9
Rukat	USDA	107	88	16.7	28.6	24.2
B 3563-2	USDA	98	73	20.8	33.0	24.4
B 3819-17	USDA	98	73	16.4	29.3	18.5
B 3424-11	USDA	76	79	17.7	29.3	15.8
5 LZ-5	Pa.	75	81	19.4	30.6	22.7
R. Burbank	USDA	70	64	19.0	31.5	19.3
L.S.D.	.05	22				

1/ Early and Midseason varieties harvested 10/2/62; chipped 10/5/62

2/ Late varieties harvested 10/25/62; chipped 11/5/62.



PENNSYLVANIA

W. R. Mills

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The potato breeding project at Penn State is carried on largely in two locations: University Park, and in Potter County, a northern, high-elevation seed area. All hybridizing, seedling production and greenhouse testing is done at University Park. First year seedlings grown at University Park; otherwise all seed is produced in Potter County. Yield trials and other data are collected from both locations. Advanced testing is done in cooperation with the Extension Department in the principal potato-producing counties of the state.

An objective of the program is to develop varieties resistant to disease, especially late blight, which possess superior chipping quality. Pennsylvania badly needs an improved variety that will recondition after prolonged cold storage. Russet Rural, by far the most desired storage variety by Pennsylvania chippers, is notorious for its tendency to go off shape and develop "doll babies" under adverse weather conditions, and is especially susceptible to various stem-end discolorations and necroses.

Selection 4QV-30, which has been under trial and evaluation for the past seven years will probably be named and released this year. Extensive tests have demonstrated very satisfactory chipping characteristics. It has chipped uniformly white when held at 70° and 50° F. When stored at 38°, some samples have made satisfactory chips directly from storage while others were dark but reconditioned in 2 or 3 weeks. Russet Rural customarily requires from 3 to 6 weeks.

Selection 4QV-30 carries gene R<sub>2</sub> plus considerable field resistance to late blight, possesses medium scab resistance and tolerance to dry weather. Over the past 6 years in yield tests at University Park and Potter County it has averaged 531 bushels per acre compared to 474 and 522 for Katahdin and Russet Rural, respectively. It matures with Katahdin, or in some years, slightly later.

In the summer of 1962, central Pennsylvania experienced its worst drought on record, with only 3.7 inches of rain from planting to August 20, as compared to the average of 12.5. All early varieties were dead and late varieties unable to make much use of average rainfall which fell during the next 4 weeks. Rainfall was below normal but well distributed in Potter County, resulting in good yields and excellent quality.

Because of limited space, only about 5000 seedlings are grown in the greenhouse. In addition, about 7000 seedlings were transplanted directly to the field. Under the drought conditions, a large majority of the transplants failed to tuber, or produced only a few small ones. However, occasional plants produced good crops. About 5% of the seedlings originating from greenhouse-grown tubers, and about 2% of the transplants were saved for further increase. It will be interesting to see if the selected transplants show above-average drought tolerance.

Late Blight. Late blight has not been epidemic in central Pennsylvania since 1958, so blight resistance has been determined exclusively in greenhouse tests. Most of the selections at hand carry genes R<sub>1</sub> and R<sub>2</sub>. Although we have been

hampered by lack of good parental material, gene  $R_3$  has been incorporated into a number of the newer selections. Of 86 new 10-hill lots saved in 1962, at least 14 carry  $R_3$  in combination with  $R_1$  or  $R_2$  or both.

Virus X. An effort is being made to combine the gene or genes for immunity to virus X with the R genes for blight resistance. Fifteen of the 86 ten-hill lots to be increased in 1963 are X immune. With improved X immune parental material on hand, a larger proportion of the crosses made in 1963 will involve X immunity.

Although immunity appears to be the ultimate solution, the question remains as to what can be done to improve a good, X susceptible variety. Opinions differ as to the value of "protective inoculation" with a mild strain. Plants of 6 varieties were indexed on Gomphrina globosa and X-free plants were isolated. The X free plants were divided into 2 lots, one kept X-free, the other inoculated with a known mild strain. A replicated field planting was made with seed of the 3 categories.

Because of the drought, yields were very low and results were inconclusive. There was however, a trend toward reduced yields by the seed stock infected with X and somewhat greater reduction from the more severe strains in the regular stock. The experiment will be repeated in 1963.



RHODE ISLAND  
J. E. Sheehan  
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Potato yield trials and chipping quality studies of 5 varieties and 2 numbered selections were conducted at the Rhode Island Agricultural Experiment Station at Kingston in 1962. Seed stock of all varieties and seedlings was obtained from USDA sources at Presque Isle, Maine. The potatoes followed 6 years of ladino clover-orchard grass sod.

Yields were calculated on the basis of 24-foot rows. Seed pieces were spaced 9 inches apart in the row with 36-inch spacing between rows. Each variety was replicated four times. Fertilizer consisted of 2000 pounds per acre of 8-12-12-2 grade applied in bands at planting time.

All varieties were planted on April 30 and harvested September 24. All varieties matured naturally, no vine killer was used.

Potatoes got started slowly due to a lack of rainfall and below normal temperatures in May but grew rapidly in June with favorable moisture and temperatures. Overall the temperature during the growing season was considerably cooler than normal except for June, while precipitation was nearly normal. The cooler temperatures and adequate moisture produced excellent yields and quality of most varieties tested.

Rhode Island table 1 gives yield and other data for the varieties and selections included in the test.

The high-yielding variety was Ontario with 522 cwt. per acre, followed by Huron 451, B2368-13 seedling 434, Ona 384 and B2894-24 with 299 cwt. per acre.

Seedling B2368-13 produced the highest dry matter content, 20.4% followed by Aremac 19.9%, Huron 19.8%, Ontario and Ona 19.4%, respectively.

Nine insecticide sprays were applied throughout the season to control various insect pests. Flea beetle, aphid and three lined beetle populations were relatively light. Colorado potato beetles which have been troublesome over the past few years were again quite numerous throughout the area. Leafhoppers became quite abundant late in the season. Sevin and Thiodan were used as insecticides and gave satisfactory results.

Starting June 5, conditions became favorable for late blight and remained so throughout most of the remainder of the growing season. Heavy infestations of blight were detected in the eastern section of the State during the third week in July. Seven fungicide sprays were applied to the variety trials throughout the growing season. No incidence of blight was detected.



Potato samples for the chipping study were placed in storage at 50° F. shortly after digging. Tubers were removed from storage and processed on December 1. They were washed in warm water, sliced unpeeled and fried in cottonseed oil at 352° F. until bubbling ceased. After draining on paper towels, the samples were color rated by a group of seven people using a Procter and Gamble Color Reference Chart. The results of the ratings are listed in the table. The lower the number, the lighter the chip color while high numbers denote darker colors. All samples scored six or lower were judged to be commercially acceptable.

Rhode Island table 1. Yield and other data for seven potato varieties grown at Kingston, Rhode Island, 1962.

Variety	Yield Per Acre		Total Solids	Color Rating	Tuber		Shape
	U.S. No. 1				Size	Skin	
	Cwt.	Pct.	Pct.				
Ontario	522	98.6	19.4	5.0	Large	Smooth	Regular
Huron	451	96.4	19.8	5.5	Medium	"	Fairly Irregular
B2368-13	434	98.2	20.4	6.0	Large	Rough	Fairly Regular
Ona	384	97.2	19.4	4.0	Small	Rough	Regular
B2894-24	299	98.3	17.9	5.0	Large	Smooth	Regular
LaChipper	287	96.5	18.2	4.0	Small	Smooth	Fairly Irregular
Arenac	259	96.4	19.9	5.0	Medium	Smooth	Regular
L.S.D. .05	100						

SOUTH CAROLINA  
W. R. Sitterly  
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I. Replicated Yield Trial

Purpose: To obtain potato varieties adaptable for commercial growing in coastal South Carolina.

Procedure: Field C-7 fertilized with 1100 pounds per acre of granular 10-10-10 on January 29, 1962. On February 2, entries were planted, sprayed with 3 pounds per acre of Eptam for nutgrass control, and bedded. A randomized block design of 5 replicates was utilized, with each plot 4 hundredths of an acre.

Concurrently, entries were also placed in another field which received identical treatment with the exception that irrigation water was never applied to this second field. This procedure allowed investigation of secondary growth, etc.

The best entries at harvest time were then subjected to shipping and chipping tests.

Notes: On April 16 and 17 the crop was subjected to temperatures of 33°F. and 36°F., respectively. From April 16 to June 1 no rain fell, necessitating two irrigation periods. From June 1 to June 10, 7 inches of rain fell. Harvest date was June 12.

Results: As shown in South Carolina table 1, the highest yielding entry was B 4529-13, followed by LA 6937.

The highest dry matter content was contained in Fundy.

The best shipping varieties were LA 2988, LA 7627, LA 6937, Sebago, and Norland.

Generally speaking the medium-early potatoes had the highest dry matter content while the early and late varieties had the lowest. Also red varieties had a lower dry matter content than whites.

South Carolina table 1. Plant characteristics of varieties entered in the 1962 potato replicated yield test at Charleston, South Carolina.

Entry	Yield U.S.1 Per Acre	Dry Matter	Matu- rity	Skin Color	Shipping test Wet rot 1/	Non-irrigated secondary growth	Internal brown- ing
	Cwt.	Pct.			Pct.	Pct.	Pct.
Fundy	114	18.0	ME		8	35	
Navajo	111	17.7	M		10		
LA 2988	135	16.4	ML		0	15	30
*LA 6937	162	17.3	M		0	23	
LA 6543	126	16.4	M-ML		20		
LA 7627	141	17.3	ME		4		
*LA 7935	144	15.5	M	Red			

continued

South Carolina table 1, continued

LA 6894	102	15.1	ME	Red			
LA 3842	54	14.3	E				
Sebago	137	16.6	M-ML		0	40	10
Snowflake	120	16.8	ME		25		
Pungo	102	16.6	ME				10
Catoosa	137	14.7	M	Red			
Norland	117	14.5	E	Red	0		10
B 498-54	135	13.7	L				
B 4529-9	126	16.6	ME				
B 4601-27	99	17.1	M				
B 4523-8	71	16.1	ME				40
B 4537-8	75	16.8	ML				
B 4529-3	72	15.3	ME-M				40
B 4563-2	84	13.5	M				40
*B4529-13	192	17.1	ME-M				
B 4523-4	147	13.2	M				60
L.S.D. <sub>5</sub>	57	2.8					

1/ Blank spaces not represented in this particular category.

Conclusions: The best white tuber variety in this test appeared to be B 4529-13, followed by LA 7627. B 4529-13 has a medium sized, spreading bush. The tubers are smooth, oval, shallow eyed, and of medium size, with crisp white flesh. LA 7627 has a medium sized spreading bush with dark green lanceolate leaves. The white tuber is smooth, oval-elongate, somewhat netted, shallow eyed, medium-large size with crisp white flesh.

The best performing red variety was LA 7935. The bush is of medium size and sprawling, with dark green leaves. The tuber is oval, smooth, medium depth eyes, medium size, with crisp white flesh.

Apparently the medium early varieties had higher dry matter contents in general than did the early or late varieties. Also the red varieties had lower dry matter contents than did the whites.

## II. Observational Trial

Purpose and Procedure: (same as for replicated yield trial)

Results and Conclusions: Of 50 entries in this trial, 9 were selected for advancement to 1963 replicated yield trials. These were selected on the basis of both internal and external tuber characteristics, maturity date, and dry matter content. These 9 were as follows:



<u>Entry</u>	<u>Maturity</u>	<u>Percent D. M.</u>
B 5230-1	ME-M	15.8
B 5209-1	M	15.4
B 5219-1	ME-M	17.1
B 5210-9	M	15.0
B 2858-5	M	15.6
B 3837-11	E	17.7
B 5222-2	ME	16.0
B 313-21	M	16.5
B 5213-1	ML	16.5

The two best entries were B 3837-11 and B 5219-1, both fairly early varieties. B 3837-11 had a small sprawling bush with a white, oval, smooth, oval-elongate, shallow-eyed tuber of medium size and crisp white flesh. B 5219-1 had a medium sized spreading bush with a white, smooth, oval-elongate, shallow-eyed tuber of medium size and crisp white flesh.

SOUTH DAKOTA  
K. D. Fisher  
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Scab Resistance. Thirty-three advance lines were tested for scab resistance at Brookings. These lines were supplied by R. V. Akeley for comparative studies in several states. Data are summarized elsewhere in this report. Another 24 selections were planted in a second scab observation plot at Brookings. No data are available as scab did not develop on susceptible varieties or on experimental materials.

Ring Rot Resistance. Thirty-one varieties and selections were hypodermically inoculated with Corynebacterium sepedonicum during 1961 field studies. In order to include data from stored tubers, these data are reported one year late. Each line was grown in three-hill plots replicated 3 times. Harvested stems were stored at 15° C; the presence of C. sepedonicum was determined by the gram stain procedure. Tubers were stored 3 months at 7° C. after harvest; presence of ring rot was based on observation of cut tubers (South Dakota table 1).

The data suggest certain ring rot resistant lines harbor gram-positive bacteria which appear morphologically similar to C. sepedonicum. While no isolations were made from inoculated stems, isolations of the ring rot organism were made from inoculated tubers of Norland-b, Red LaSoda-b, Irish Cobbler-b, Saranac, B909-2, B2855-5, B3102-3, B3201-38, B3309-8, B3353-16 and Ia 1111-8. Only those cultures isolated from Norland-b, Red LaSoda-B, Irish Cobbler-b and B3309-8 were pathogenic to Norland in subsequent tests.

Tubers saved from 1961 were planted in 1962. Stems and tubers were harvested and stored as above. Gram-positive bacteria were observed from stems of these plants (South Dakota table 2). Five tubers of Norland-b, Teton, B2855-5, B3478-45, and B3857-19 were surface sterilized, ground and centrifuged to remove the majority of starch grains. The remaining liquid was used to hypodermically inoculate susceptible Norland seedlings in the greenhouse. Except for inoculum from Norland-b, all attempts to transmit ring rot were unsuccessful. Similarly, rubbing the cut surface of tubers of the above lines on the surface of Norland seed pieces did not result in disease transmission. These results indicate selections appear to harbor ring rot bacteria, but there is no evidence that these selections are symptomless carriers of the disease.

Varietal Performance. A number of new varieties were evaluated for yield, scab reaction and chipping quality at the Northeast Research Farm, Watertown. The majority of the seed was supplied by A. E. Schark, USDA, Presque Isle, Maine. Di-syston (2.5 lbs/A actual) was applied with 200 lbs/A of 12-8-0 fertilizer prior to planting. Plants were spaced at 12 inches within the 42 inch rows. Plots were 30 ft. long. Each variety was replicated twice. DDT (1 lb/A) and Maneb (2 lbs/A) were applied at 10 day intervals during July. Length of growing season was 122 days. Chip color was determined with the cooperation of the Polly Parrot Potato Chip Company, Sioux Falls, South Dakota. Results are summarized in South Dakota table 3.

South Dakota table 1. Ring rot reaction of inoculated varieties and selections, 1961.

Pedigree	Inoculated <sup>1/</sup>		Non-inoculated <sup>1/</sup>	
	Stem	Tuber	Stem	Tuber
Norland-a <sup>2/</sup>	---	---	3/3	4/7
Norland-b	3/3	1/6	0/3	0/14
Red LaSoda-a <sup>2/</sup>	---	---	3/3	8/12
Red LaSoda-b	3/3	2/25	0/3	0/10
Irish Cobbler-a <sup>2/</sup>	---	---	3/3	7/11
Irish Cobbler-b	3/3	19/32	0/3	0/7
Merrimack	3/3	0/6	2/3	0/17
Saranac	0/3	1/30	2/3	0/11
Fundy	3/3	0/17	2/2	0/14
Teton	3/3	0/14	3/3	0/19
Bounty	3/3	0/19	1/3	0/21
B776-E	3/3	0/23	2/2	0/31
B721-29	3/3	0/32	3/3	0/26
B725-32	3/3	0/14	3/3	0/17
B909-2	1/3	0/17	3/3	0/12
B911-21	3/3	0/14	3/3	0/16
B2855-5	2/3	2/23	2/2	0/23
B3102-3	3/3	1/28	1/3	0/21
B3201-38	1/3	1/21	0/3	0/19
B3309-8	3/3	3/17	1/1	0/13
B3352-8	0/2	0/11	0/1	0/15
B3353-16	3/3	1/16	3/3	0/18
B3478-45	3/3	0/16	3/3	0/21
B3857-19	3/3	0/31	0/3	0/10
B3873-10	3/3	0/11	3/3	0/6
B3922-1	3/3	0/29	0/3	0/26
B4132-3 West Virginia	3/3	0/27	3/3	0/22
B4134-14	2/2	0/11	1/2	0/8
B355-35	2/3	0/14	1/2	0/19
B3139-24	1/2	0/18	0/1	0/11
Ia 1111-8	2/2	1/18	3/3	0/20

<sup>1/</sup> Fraction indicates number containing coryneform bacteria per number observed.

<sup>2/</sup> Previously infected lot.



South Dakota table 2. Selections inoculated in 1961 showing coryneform bacteria in plants during 1962 growing season.

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<u>Pedigree</u>	<u>Plants infected</u> <sup>1/</sup>
Norland-b	3/3
Norland-c <sup>2/</sup>	0/3
Teton	3/3
B776-E	1/3
B725-32	0/3
B909-2	2/3
B911-21	0/3
B2855-5	3/3
B3102-3	2/3
B3353-16	0/3
B3478-45	3/3
B3857-19	3/3
B3873-10	1/3
B3922-1	2/3
B4132-3 West Virginia	2/3
B4134-14	1/3
B3139-24	2/3
Ia 1111-8	1/3
B721-29	2/3
B3201-38	0/3

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1/ Fraction indicates number containing coryneform bacteria per number observed.

2/ Non-inoculated infected check from 1961.

South Dakota table 3. Potato variety performance scab reaction and chipping quality.

Variety	Yield per Acre		U.S. No. 1 Area	Scab 1/ Type	Specific Gravity	Chip Color 2/ Fresh 3/ Reconditioned 4/	
	U.S. No. 1	Cwt.					
Red Pontiac	83	91	1	2	1.065	10	10
Red LaSoda	85	93	T	1	1.067	9	10
Norland	101	86	2	1	1.073	4	5
LaRouge	80	90	1	1	1.081	5	6
Redskin	156	95	1	3	1.080	8	10
Bounty	137	95	Russet		1.089	6	6
Early Ohio	63	77	T	1	1.086	4	9
Dazoc	93	81	T	1	1.088	4	10
Red Warba	98	83	2	1	1.084	6	10
Russet Rural	90	83	Russet		1.096	5	6
Haig	65	80	Russet		1.084	3	5
Kennebec	129	93	T	1	1.088	4	5
Sebago	80	93	T	1	1.080	5	7
Katahdin	90	97	1	1	1.088	5	8
Pungo	125	94	T	1	1.092	6	7
Ontario	85	89	1	1	1.085	6	9
Nordak	71	91	T	1	1.084	5	10
Norgleam	91	88	Russet		1.088	3	7
LaChipper	94	90	2	1	1.092	4	7
Merrimack	74	92	1	1	1.090	6	10
Teton	91	91	T	1	1.090	5	8
Fundy	76	92	T	1	1.090	7	9
White Cloud	92	82	T	1	1.087	4	7
Saranac	55	71	Russet		1.084	9	10
Blanca	65	82	Russet		1.096	6	10
Navajo	66	88	Russet		1.093	4	6
Snowflake	105	88	1	2	1.093	6	5

1/Scab rated as follows: Area - T = less than 1% of tuber surface scabby  
 1 - 1-20%  
 2 - 21-40%  
 3 - 41-60%  
 4 - 61-100%  
 Type of lesions  
 1 - small, superficial  
 2 - large, superficial  
 3 - large, raised, rough  
 4 - pit type scab

2/Based on a scale of 1-10, 1-5 acceptable, 6-10 too dark to be acceptable.

3/Chipped 22 days after harvest, no cold storage.

4/Stored 75 days at 38° F; reconditioned 3 weeks at 65-70° F.

TENNESSEE  
(Crossville)  
T. R. Gilmore  
-----

A potato yield trial was conducted at the Cumberland Plateau at Crossville, Tennessee. The plot was fertilized with 1200 lbs. of 6-12-12, broadcast on the plot and an additional 300 lbs. of 6-12-12 was applied in the row.

The rainfall of the month of May and the first part of June was very low and during that dry period the plot was irrigated twice by overhead irrigation. The yield obtained was considered to be satisfactory and somewhat higher than average.

Tennessee table 1. Yield data for 11 varieties of potato tested at Crossville, 1962.

Variety or Seedling	Parentage	U.S. No. 1 Yield per acre <sup>1/</sup>
3815-R <sup>2/</sup>		Bu. 516
Norland <sup>2/</sup>		473
Catoosa <sup>4/</sup>		430
4524-7 <sup>2/</sup>		380
Catoosa <sup>6/</sup>		373
TL 6894 <sup>4/</sup>	2910-1 x B 3131-8	339
Katahdin <sup>4/</sup>		339
4122-2 <sup>2/</sup>		337
TL 6937 <sup>5/</sup>	B 792-88 x B 962-32	302
TL 6937 <sup>3/</sup>	B 792-88 x B 962-32	294
TL 6937 <sup>4/</sup>	B 792-88 x B 962-32	251
L.S.D. .05		41
L.S.D. .01		53

<sup>1/</sup>Average of 3 replications of 25 plants each, spaced 12 inches apart in rows 4 feet apart.

<sup>2/</sup>Seed tubers grown in North Dakota.

<sup>3/</sup>Seed tubers grown in Wisconsin.

<sup>4/</sup>Seed tubers grown in Maine.

<sup>5/</sup>Seed tubers grown in Nebraska.

<sup>6/</sup>Seed tubers grown in Tennessee.



TEXAS

Bruce A. Perry, Robert V. Akeley, D. M. McLean,  
D. R. Paterson, Virgil I. Woodfin, Jack H. Kyle,  
J. M. Coruthers and Harry M. Meyer  
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Screening and Evaluation of Potato Varieties and Breeding Lines

The potato program consisted of evaluating breeding lines in 5-hill plot plantings at different locations, growing seedling tubers at 2 locations, and yield plots at 3 locations within the State. Many of the 5-hill planted lines were grown in 6 locations: 1) Lower Valley, 2) Winter Garden Station, 3) Brazos Valley, 4) Munday, 5) Lubbock and 6) Prairie View. About 150 breeding lines were available for the 5-hill plantings, with sufficient seed to include many of them at all 6 locations. About 75 of the lines were selected for further testing, either in yield test or repeat 5-hill planting.

About 10 thousand seedling tubers were grown from 30 hybrid combinations. These were planted on the Winter Garden Station and in the Lower Valley. The planting in the Lower Valley was lost from flooding. From the Winter Garden planting 34 single-hill selections were made. The seedling selections were shipped to Greeley, Colorado for seed increase. Selections from this phase of the work represent 15 families and are reported in Texas table 1.

Replicated yield tests of varieties and breeding lines were conducted at the Winter Garden Station and Prairie View. Results of these tests are reported in Texas tables 2 and 3.

Texas table 1. Selections made from single-tuber seedlings and sent to Greeley, Colorado for increase, 1962.

Pedigree		
Number	Parentage	Segregating for:
BT 1648-1	B 4312-4 Sf.	Red, lb, Sc, Tr. nem. res.
BT 5404-1	Plymouth x (x 1276-185)	White, lb, Sc, AI, L. roll, C.R. spot
BT 5404-2	"	"
BT 5404-3	"	"
BT 5404-4	"	"
BT 5408-1	WV14-17xB 4093-11	Russet, lb, Sc, AI, VW
BT 5409-1	WV14-17xB 4312-4	Red, lb. Sc, AI, T. rot, nema.
BT 5410-1	WV37-56xB 3692-4	Whites, lb, AI
BT 5410-2	"	"
BT 5410-3	"	"
BT 5410-4	"	"
BT 5410-5	"	"
BT 5410-6	"	"
BT 5411-1	X96-56x (x1276-185)	White, lb, Sc, AI, L. roll
BT 5412-1	X96-56x B4093-11	Russet, lb, Sc, AI, L. roll
BT 5412-2	"	"
BT 5412-3	"	"
BT 5419-1	B605-10x "	Russets, lb, AI, Vw, Cr. spot
BT 5419-2	"	"

continued

Texas table 1, continued

BT 5422-1	B929-23xB3692-4	White, lb, Sc, XI, br. rot
BT 5422-2	"	"
BT 5422-3	"	"
BT 5422-4	"	"
BT 5423-1	B991-44 x B3944-29	White, lb, Sc, r. rot, G. nema.
BT 5423-2	"	"
BT 5423-3	"	"
BT 5445-1	B3692-4 x B3820-37	Russet, lb, AI, Vw, L. roll
BT 5460-1	B4296-1 x Cherokee	White, lb, Sc, YR, Vw
BT 5466-1	B991-14 x B3095-11	White, lb, Sc, L. roll
BT 5466-2	"	"
BT 5466-3	"	"
BT 5477-1	X927-3 x Merrimack	White, lb, Sc, r.rot, AI,L.roll,C.R.spot
BT 5477-2	"	"
BT 5489-1	B4523-8 x (x96-56)	White, lb, Sc, AI, G. nema.

Texas table 2. Yield test, Winter Garden Station, Crystal City, Texas, 1962.

Variety or Pedigree No.	Parentage	Yield	Culls
		U.S. No.1	Per acre
		Cwt.	Cwt.
Red Pontiac		158	27
IL 5774-1	I 1133-1 x Katahdin	15	7
BL 4472-1	B 595-76 x 3944-11	48	37
BT 5016-4	B 3725-1 x Yampa	51	13
IL 57410-2	La 1354 x I 1027-18	41	30
BT 5003-2	B 3139-24 x B 4154-2	18	20
BL 4576-2	B 595-76 x Katahdin	38	16
Ona	B 3021-3 x B 2968-31	139	37
BL 4590-2	Pontiac x Redskin	43	26
BT 5025-2	B 4087-5 x Merrimack	94	17
BT 5043-2	B 789-388 x Katahdin	28	22
BL 4593-5	Triumph x Redskin	51	27
BT 5016-5	B 3725-1 x Yampa	23	13
BT 5016-6	" x "	30	12
Catoosa		144	33
TL 6894	2910-1 x B 3131-8	129	16
TL 6937	B 792-88 x B 962-32	140	27
L.S.D. .05		19	13
L.S.D. .01		26	17

Texas table 3. Yield test, Prairie View,\* Texas, 1962.

Variety	Marketable		Variety	Marketable	
	Yield per acre			Yield per acre	
	Cwt.			Cwt.	
Mohawk	42		Green Mountain	38	
Catoosa	66		Boone	7	
Plymouth	56		Irish Cobbler	30	
TL 6727	63		Chippewa	60	
Early Gem	39		Onaway	71	
White Rose	60		Cherokee	50	
B 605-10	58		Delus	34	
Kennebec	58		Pontiac	112	
Pungo	93		Triumph	39	
Teton	81		Katahdin	71	
Saco	80				
L.S.D. .05	28				
L.S.D. .01	37				

\*Planted March 2 and harvested June 15. Fertilized with 1200 lbs. 12-12-12 per acre, applied in bed. Moisture very deficient last half of growing season.



VERMONT

Wilfred R. Kelley, Richard Jensen, Hugh Murphy

A variety trial consisting of twelve entries was conducted at Craftsbury, Vermont as part of the Maine-New Hampshire-Vermont cooperative variety trial program. All trials in all States are in cooperation with the National Potato Breeding Program. The plots in Vermont were planted on May 24 and harvested in October. The trial consisted of five replicates of each variety arranged in a randomized block design. Fertilizer applied was 130-150-150 per acre. All varieties were spaced at nine inches apart in 34-inch rows.

Planting conditions were ideal in Vermont but moisture was above normal for most of the growing season for production of high quality tubers. Harvesting conditions were wet and cool for most of the Tri-State area.

Vermont table 1. Yield, specific gravity, percentage of yield between 1-7/8 to 4 inches in size and chip color index for 12 varieties grown in Vermont, 1962.

Variety	Yield per acre Cwt.	Specific gravity	Chip color index	1-7/8-4 inches	2-1/4-4 inches
Huron	396	1.081	9.7	96	77
Pungo	345	1.074	8.1	96	89
Kennebec	341	1.077	5.9	97	87
Katahdin	334	1.075	7.5	98	88
Mohawk	324	1.085	8.5	98	89
Golden Chip	316	1.075	6.7	95	84
Sebago	315	1.081	7.4	96	74
Delus	311	1.082	6.9	98	92
Fundy	248	1.073	7.3	98	87
Avon	213	1.072	5.2	96	82
Norland	211	1.061	7.0	94	67
43-50	130	1.072	9.2	93	81
L.S.D. 0.05	46	0.003	0.8		
L.S.D. 0.01	65	0.004	1.0		

VENEZUELA  
Alvaro Montaldo  
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The potato culture was conducted at three altitudes:

Low zone: 500-700 m.  
Medium zone: 700-1.500 m.  
High zone: 1.500-3.500 m.

To each one of these zones the potato reacts in a different way. In the Low zone the best adapted potatoes are those from the "tuberosum type" with material from the programs of United States and Canada. The mean temperature is about 25° C. and the potato is cultivated the year around.

In the Medium zone the best potatoes are from the "tuberosum type" but with germ plasm selected by the European conditions and some from crosses of "tuberosum x andigenum." Mean temperature of 20° C.

In the High zone the best material is that produced by the Colombian potato breeding program with crosses of "tuberosum x andigenum." Mean temperature of 15° C.

Venezuela table 1. Yields, specific gravity, Alternaria and Jelly end rot of eleven varieties of potato, 1962.

Variety	Yield Per Acre <u>1/</u> Cwt.	Specific gravity <u>2/</u>	Alternaria <u>3/</u> Pct.	Jelly end Tuber rot <u>4/</u> Pct.
Red Pontiac	143	1.060	10	57.6
Saco	138	1.061	20	45.6
Redskin	132	1.062	30	45.3
Pungo	131	1.063	10	45.5
Excel	110	1.072	0	51.9
Patrones	108	1.079	0	39.9
Kennebec	107	1.063	0	51.3
Alpha	103	1.069	10	29.8
Sebago	96	1.061	0	44.7
Fundy	86	1.068	0	46.5
Oma	53	1.062	0	47.6
L.S.D. 5%	27			

Locality: Maracay.

Date of planting: January 4, 1962.

Altitude: 500 m.

Date of harvesting: April 4, 1962.

1/ Average of 4 replications of 66 hills, 2-row plots.

2/ Based on 50-tuber sample.

3/ Alternaria solani infection on March 2, 1962.

4/ Based on 2 slide-rows (4-row plots) harvested on April 24, 1962, 20 days after regular harvest time.

Venezuela table 2. Yields and specific gravity of 12 Dutch varieties of potato compared with Sebago in two locations, at altitudes of m. (Maracay) and 700 m. (Chirgua).

Variety	Yield per acre <u>1/</u>		Specific gravity <u>2/</u>	
	Maracay	Chirgua	Maracay	Chirgua
	Cwt.	Cwt.		
Z.P.C. 52-0113	82	16,980	1.060	1.068
Konst 53-212	74	11,133	1.060	1.070
Dujhuis 53-66-2	54	11,124	1.062	1.067
Rademakers 54-103	66	10,854	1.062	1.072
Engelum H. 468	11	9,831	1.060	1.060
Plato	35	9,630	1.061	1.076
H.G.M. 53-222	87	9,273	1.061	1.075
Alpha	52	8,863	1.065	1.075
Offereins 53-116	65	8,054	1.060	1.062
Sebago	74	7,757	1.060	1.069
Patrones	74	7,556	1.078	1.089
Zingstra 51-676	62	7,073	1.066	1.080
Wigro	41	6,597	1.062	1.078
L.S.D. 5%	32	4,469		

Date of planting: Maracay, Dec. 12, 61 - Chirgua, Dec. 14, 61.

Date of harvesting: Maracay, Mar. 23, 62 - Chirgua, Mar. 22, 62.

1/ Average of 4 replications of 66 hills, 2-row plots.

2/ Based on 50-tuber sample.



WASHINGTON  
Wm. G. Hoyman  
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Most all of the parents used for the 1961 breeding program had russet skin and resistance to the pathogens causing verticillium wilt, common scab, late blight and certain viruses. Seed was obtained from 35 parental combinations.

Forty thousand seedlings were transplanted into 3.5-inch pots and grown in the 2 screenhouses. These were planted in May and harvested in September.

Approximately 35,000 seedling tubers were planted on 9.5 acres of the Roza Unit during April. Of the 89 single hills saved from the harvest in September, all but a few had russet skin.

The 144 single hills saved from the 1961 Roza Unit seedling plot were indexed in the greenhouse the early part of 1962. Seventy-six were planted at Prosser and at the Mt. Adams isolation plot. Data on the 13 selections saved for further testing and increasing in 1963 are shown in Washington table 1. The specific gravity of Russet Burbank was 1.084.

The 13 selections in table 1 were planted in the verticillium wilt plot at Prosser April 25 and harvested September 5, a growing period of 19 weeks. Six of the 13 showed no vine symptoms and symptoms on 6 others did not appear until September 4. The parents, PI208332 and PI214372, have wilt resistance and are high in dry matter content.

Approximately 25,000 B-size seedling tubers were sent to Dr. S. A. Alfieri, Potato Experiment Station, Greeley, Colorado, to be planted at Cheyenne, Wyoming.

Five selections were sent to Mr. George Carter, Klamath Branch Experiment Station, Klamath Falls, Oregon, for inclusion in his verticillium wilt test.

Two hundred and twenty-six selections were obtained from R. V. Akeley, U. S. Department of Agriculture, for planting in the verticillium wilt test at Prosser. Washington table 2 shows the dates vine symptoms appeared, skin color, and specific gravity of the 5 selections that were saved for further testing in 1963.

Solanum species, species hybrids and foreign varieties were received from the Potato Introduction Station, Sturgeon Bay, Wisconsin, to be tested for their reaction to Verticillium albo-atrum. The 60 introductions shown in table 3 were planted April 27 at Prosser and the final reading was taken September 4. A majority of the foreign varieties did not show any vine symptoms.

The 11 selections and 10 varieties in table 4 were exposed to a natural infection of the leafroll virus when grown at the Northwestern Washington Experiment Station, Mt. Vernon, Washington, in 1961. A random sample of seed from each was saved to plant 100 hills of each in 1962. The percentage of chronic (secondary) leafroll varied from 10 (B4102 and La3769) to 100 (ND3815-1R).

Thirty-six selections and three varieties were harvested in September and stored at 40° F. until chipped in December. The purpose of this test was to determine which ones would make satisfactory chips when processed immediately from this storage temperature. Reference was made to the color standard of the National

Potato Chip Institute when recording the chip color ratings in table 5. This was the first time all the selections listed in table 1 had been chipped and it was surprising that all but 2 had ratings of less than 7. B3620-1 had a rating of 6 in 1961 and 4 this year. It was also resistant to Verticillium albo-atrum in this year's test.

Washington table 1. Data on selections to be increased and used for parental stock, 1962.

Selection	Parentage	Skin color	Reaction to		Fertility	Specific gravity
			Late blight	Verticillium Date symptoms appeared		
7-2	F52-5 x PI208332	Russet	+		R <sup>1</sup>	1.095
7-4	" "	"	-		R	1.075
11-13	F52-8 x PI208332	"	-	9/4	R	1.077
11-29	" "	"	-		R	1.099
12-3	F52-8 x PI214372	"	-	9/4	R	1.095
12-6	" "	"	-		R	1.095
15-1	F52-9 x PI208332	"	-	9/4	R	1.097
15-12	" "	"	-		R	1.090
15-13	" "	"	+	9/4	R	1.098
22-9	A371-1 x PI214372	"	+	9/4	R	1.082
22-10	" "	"	+		R	1.085
39-1	ND3435-17 x PI208332	"	-	9/4	R	1.098
48-1	B3820-14 x PI214372	White	+	8/22	R	1.096

<sup>1</sup>R = resistant.

Washington table 2. Skin color, date of first verticillium wilt vine symptoms and specific gravity of 5 seedlings selected from 226 received from R.V.Akeley, 1962.

Pedigree Number	Parentage	Skin Color	Date Verticillium Symptoms	Specific Gravity
B4987-36	47156 x B3139-24	W	None	1.077
B5011-31	B3556-12 x A180-26	W	None	1.090
B5011-41	" "	W	8/22	1.084
B5023-42	B3950-1 x B3556-12	W	9/4	1.090
B5063-3	Houma x Redskin	Red	None	1.100

Washington table 3. Date of first verticillium wilt vine symptoms of Solanum species, species hybrids and some foreign varieties, 1962.

Species	Date first symptoms	Variety	Date first symptoms
<u>Solanum andigena</u> introductions		Foreign varieties	
PI 195211		Aquila	
PI 230499.1	9/4	Bevelander	
PI 243381.2	8/22	Centifolia	9/4
PI 243382.7	9/4	Eva	8/22
PI 243383.4	*	Jacobi	8/22
PI 243384.1	9/4	Kerrs Pink	

continued

Washington table 3, continued.

PI 243390.6	9/4	Monak	
PI 243396.4	9/4	Oberarabacher Fruhe	8/1
PI 243400.4	9/4	Olympia	
PI 243401.1	9/4	Ostbote	
PI 243404.3		Panther	
PI 243436.4	9/4	Rheingold	
PI 243440.3		Tebon	7/19
PI 243450.3		Urgenta	
PI 243453.6		Urtica	
<u>Species hybrids</u>		<u>Species hybrids</u>	
US-W 1001.19	8/1	US-W 5279.7	9/4
US-W 1093.2	9/4	US-W 5279.8	9/4
US-W 1130.1	8/1	US-W 5285.1	9/4
US-W 1139.4	8/22	US-W 5285.3	8/22
US-W 1143.5	8/22	US-W 5286.5	9/4
US-W 1143.6	8/1	US-W 5286.7	9/4
US-W 1198.1	8/22	US-W 5289.6	9/4
US-W 1226.3	8/22	US-W 5289.7	8/1
US-W 1274.2	8/22	US-W 5291.1	8/1
US-W 1277.1	8/22	US-W 5291.2	8/22
US-W 1460.1	8/22	US-W 5294.6	8/22
US-W 1460.2	9/4	US-W 5300.1	9/4
US-W 1462.2	8/22	US-W 5332.1	
US-W 5067.2	8/1	US-W 5336.7	9/4
US-W 5177.1	9/4	US-W 5338.6	9/4

1/ Absence of date means no vine symptoms.

\* Plants weak and died soon after emergence.

Washington table 4. Percentage of chronic leafroll infection, 1962.

Selection	Percent	Variety	Percent
A175-7	82	Canso	75
B4102	10	Early Gem	30
CS131-18	40	Houma	50
F29-1	16	Huinkel	16
F117-1	95	Manota	80
La 3769	10	Merrimack	50
La 4112	98	Redburt	95
La 4245	80	Russet Sebago	20
ND 3815-1R	100	Plymouth	40
ND 4121-25	42	Pungo	95
X127-55	15		



Washington table 5. Potato chip color when processed immediately from 40° F. storage, 1962.

Selection	Color	Selection	Color	Selection	Color
7-2	4	A596-1	7	F107-71	7
7-4	7	B3620-1	4	F127-3	6
11-13	5	B3627-18	8	F158-4	7
11-29	3	B2759-5	4	F4519	7
12-3	3	B3820-14	7	F5459	8
12-6	4	B4841-1	7	F5609	6
15-1	4	B4848-1	7	RD4-22	8
15-12	4	B4877-8	7	RD8-11	7
15-13	4	F93-5	4	RD109-4	8
22-9	7	F107-1	8	RD175-7	7
22-10	6	F107-21	7	Avon	7
39-1	4	F107-29	4	Hunter	8
48-1	3	F107-30	7	Russet Burbank	8

WEST VIRGINIA

K. C. Westover and LeRoy P. Stevens  
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The testing and selecting of varieties and seedlings for desirable horticultural characteristics was done at the Reedsville Experiment Farm (altitude 1800 feet) by the Department of Horticulture. The breeding and screening for disease resistance was carried on by the Department of Plant Pathology at Huttonsville, West Virginia (altitude 2000 feet) and in the pathological greenhouse in Morgantown. Isolated plantings of the new family lines and all the seedlings and the named stocks under test at Reedsville were made in Canaan Valley, West Virginia (altitude 3250 feet) where they were frequently and thoroughly rogued to provide planting material for future work.

Growing conditions at both locations--Reedsville and Canaan Valley--were favorable with the exception of an early season hail storm which severely damaged the planting in Canaan Valley. The Reedsville plantings were made on a deep well-drained silt loam (Atkins) in good tilth. A heavy clover sod was turned under immediately before the area was planted. The soil (Unger) conditions in Canaan Valley were equally as good. The plantings at both locations were made by machine (assisted feed) and each received the equivalent of a 1500-pound application of 5-10-10 commercial fertilizer applied bandwise and of granular diSyston (2-3 lbs. active per acre) over the seed piece by applicator. Premerge weedicide was applied soon after planting. When the buds were swelling, the plantings were moderately hilled. The rows in all the plantings were 36 inches apart and the spacing between sets was 10 inches except in the 10-hill unit planting. Only the late harvest of seedstocks was made at Canaan Valley because of low yields resulting from hail damage early in the season.

Family Line Planting. Twelve family lines (2116 tubers) from Beltsville were planted in Canaan Valley. The spacing between sets was 40 inches. Thirty-five selections based on tuber appearance and yield from nine of the families were made at harvesttime. These selections will be tested at Reedsville and increased in Canaan Valley this coming season.

10-Hill Unit Planting. Fourteen selections were retained from the 50 planted. In this planting the hills were 20 inches apart and the units were separated by a 40-inch space to permit machine harvest. Check units of Cobblers and Sebagos for comparative purposes, alternated every third unit in the row and were staggered in the rows across the planting, so that each selection was abutted or flanked by at least one "check" variety and was not more than a row removed from the other. These selections will be planted in 50-foot row tests next season.

45-Foot Row Planting. Thirty-eight seedling selections and varieties were planted. Thirteen seedlings and three recently named varieties have been retained for more testing. A single row of each was planted. Cobbler and Sebago check rows alternated every third row so that each stock on trial was flanked by one of the check varieties and only a row removed from the other. Plant descriptions were taken when at full bloom and at harvesttime 2 ten-tuber samples were taken and immediately tested for total solids. West Virginia table 1 summarizes the data other than plant descriptions from the selections retained, several of which will be included in next season's replicated trials.

Replicated Planting. Seventeen seedling selections of several years observation, 3 of the newer varieties and 5 established varieties in the state comprised the replicated planting, which consisted of 4 replications of a 45-foot, single-row plot of each seedstock in an incomplete block (lattice) arrangement 1/. Plant descriptions and tuber samples were taken. Yield and total solid data are summarized in West Virginia table 2.

West Virginia table 1. Yields and total solids from 45' row trials, Reedsville Experiment Farm, 1962.

Variety	Parentage	U.S. No. 1's Cwts.	Off <u>1/</u> Grade Cwts.	Off Grade Pct.	Total Solids Pct.
B4764-1 W. Va.	Onaway x Cherokee	350.1	16.8	4.6	20.7
B69-16	Katahdin x B96-56	329.4	15.5	4.5	19.2
B5089-6 W. Va.	B606-3 x B3692-4	307.2	21.3	6.5	18.6
B5089-15 W. Va.	B606-3 x B3692-4	294.0	21.3	6.8	15.2
B5089-9 W. Va.	B606-3 x B3692-4	289.8	23.9	7.6	18.2
B1609-1 W. Va.	B3692-4 selfed	263.3	35.8	12.0	28.9
B5140-3 W. Va.	B3428-20 x B3813-20	262.3	36.1	12.1	21.4
B5051-5 W. Va.	Boone x B3139-24	236.2	7.4	3.1	18.4
WV 84-3		235.5	17.4	6.9	17.9
Chippewa		222.0	15.2	4.7	18.0
Avon		216.8	10.6	4.7	18.6
B4741-1 W. Va.	B991-14 x B929-32	192.0	5.8	2.9	18.2
B5039-3 W. Va.	X927-3 x 4154-2	188.8	48.1	20.3	18.6
I 961-1	44-8-4 x B96-56	178.8	16.8	8.6	16.2
Cobbler	Ave. of 12 checks	172.0	20.3	10.6	
Sebago	Ave. of 10 checks	180.0	15.2	7.8	

1/ Off grade is based on total yields.

1/ Gertrude M. Cox and Robert C. Eckhardt. The Analysis of Lattice and Triple Lattice Experiments in Corn Varietal Trials. Iowa Agr. Exp. Sta. Res. Bul. 281. 1940.







West Virginia table 2. Yields and total solids from replicated trials,  
Reedsville Experimental Farm, 1962.

Variety	Parentage	U.S. No.1's Cwts.	Off <u>1</u> / Grade Cwts.	Off Grade Pct.	Total Solids Pct.
B4518-14 W. Va.	96-28 x WV 14-17	325.8	47.5	12.9	18.8
B4518-11 W. Va.	96-28 x WV 14-17	323.3	16.4	4.8	21.2
La 1354-1	Pontiac x 92-36-5	320.4	10.2	3.1	18.4
Huron		316.4	22.3	6.6	19.9
I 1412-6 W. Va.	I 1077-W-28-5 x I902-3	308.3	10.5	3.3	18.2
B 3739-3 W. Va.	3 NC-9 x Ac 25953	283.3	51.2	15.3	18.6
B 4577-2 W. Va.	B 3209-35 x B606-3	274.9	20.5	6.9	17.3
Pontiac		272.8	79.1	22.5	16.9
WV 48-39		272.2	20.0	6.8	18.0
I 8140-I-La	45-11-26 x B67-11	265.3	24.9	8.6	19.7
B 4841-1 W. Va.	B 3950-1 x B 3139-24	262.7	18.9	6.7	15.8
B 4362-2 W. Va.	B 922-3 x 96-56	259.4	22.5	8.0	17.1
B 4518-10 W. Va.	96-28 x WV 14-17	250.4	30.0	10.7	19.4
B 4582-7 W. Va.	B3298-24 x B3139-24	250.0	54.4	17.9	20.3
Cobbler		242.6	22.6	8.5	20.1
Sebago		241.0	15.6	6.1	18.6
WV 37-56		240.4	62.7	20.7	18.2
B4832-5 W. Va.	B3428-31 x B3139-24	232.2	12.5	5.1	
B4832-6 W. Va.	B3428-31 x B3139-24	231.3	8.8	3.7	18.0
B4837-1 W. Va.	B3897-1 x B3950-1	219.5	16.7	7.1	18.4
Katahdin		205.6	15.6	7.1	18.6
Kennebec		203.7	8.4	4.0	21.2
Fundy		184.1	20.1	9.8	17.7
Merrimack		182.2	12.9	6.6	22.7
B3721-3 W. Va.	Ac 25953 x 3160-12	115.2	37.1	24.4	16.0
L.S.D. 1%		90.9			
L.S.D. 5%		34.2			

1/ Off grade is based on total yields.



WISCONSIN

R. W. Hougas, S. J. Peloquin, A. G. Gabert, R. W. Ross

Genetics and Cytogenetics of the Tuber-Bearing Solanum species  
(Cooperative ARS, USDA and Wisconsin Station)

Studies related to haploidy in Solanum tuberosum and in the subspecies andigena were again emphasized in 1962. Particular emphasis was given to the following areas: (1) obtaining more haploids, (2) factors affecting haploid frequency, (3) fertility of haploids and haploid-S. phureja hybrids, (4) employing haploids in genetic, cytogenetic and breeding studies.

A total of 1392 new haploids were identified during the year. These haploids were obtained from 7 varieties, 23 breeding stocks and 6 andigena selections (Hougas table 1).

Hougas table 1. Haploids isolated from varieties, and breeding stocks of S. tuberosum and from subspecies andigena.

Parent	Number of haploids	Parent	Number of haploids
Cayuga	3	B 47156	12
Chippewa	153	La 1859	2
Katahdin	37	Minn. 1	3
Merrimack	565	Minn. 113-1	21
Norland	2	Minn. 10-5-12	1
Tawa	55	Minn. 20-20-34	2
Snowflake	9	Wis. x 137	32
B 69-16	1	Wis. x 143	25
B 294-38	5	Wis. AG-231	347
B 595-76	18	<u>andigena</u>	
B 792-88	1	P.I. 186179	1
B 926-9	3	P.I. 205623	7
B 929-23	21	P.I. 209433	5
B 929-32	3	P.I. 230457	13
B 1172-16	2	P.I. 214437	4
B 2340-2	12	P.I. 253705	6
B 3139-24	3		
B 3444-23	10	Total	1392
B 3473-32	4		
B 3556-12	3		
B 3606-5	1		

In an attempt to speed up the accumulation of a large number of haploids, the following factors have been studied for their effect on the frequency of haploids: (1) decapitation of the seed parent, (2) selection of the seed parent, (3) selection of the pollinator, (4) temperature range in the air-conditioned greenhouse, (5) growing the decapitants in a nutrient solution, (6) multiple pollinations, and (7) delayed pollinations. The results of factors (2) and (3) are shown below.

Treatment	Haploids/100 Fruit	Remarks
2. Selection of the Seed Parent Superior (2)	10	Average for many pollinators, Merrimack and Wis. AG-231
Inferior (20)	1	Range from 0 to 5
3. Selection of the Pollinator Superior (3)	10	Average for many seed parents, 3 selections of <u>S. phureja</u> P. I. 225682.
Inferior (70)		Range from 0 to 2.5.

The influence of the pollinator is qualitatively inherited with inferiority being dominant to superiority.

The naturally occurring temperature in the air-conditioned greenhouse was found to be more favorable for the haploid search than constant or artificially alternating temperatures in the range of 55° - 75° F.

Factors 5, 6, and 7 had no favorable influence on haploid frequency.

Combining (a) superior seed parents with (b) superior pollinators, using (c) the decapitation technique, in (d) an air-conditioned greenhouse with a temperature range of 55° - 75° F. has led to frequencies as high as 80 haploids per 100 fruit.

Nine hundred and sixty-three haploids were grown in the field and approximately 600 flowered. Of those tested for fertility 307 were female fertile and 47 were both male and female fertile.

A workable level of male and female fertility is essential for genetic study of Solanum tuberosum haploids and for exploring the possibility of breeding potatoes at the diploid level. The pollen-fertile hybrids from cultivated diploid species--haploid S. tuberosum matings seemed to provide one means of overcoming the problem of low male fertility in haploid crosses.

Sixty F<sub>1</sub> hybrids previously selected for desirable tuber characteristics and yield without regard to fertility were used. These hybrids represented 16 combinations of 11 S. phureja introductions with 2 male-fertile haploids (US-W 1 from Katahdin and US-W 42 from Chippewa). All 60 F<sub>1</sub> hybrids flowered and all were fertile both as females and as males. The 3238 pollinations yielded 2210 fruit (68%) containing an average of 242 seeds per fruit. A total of 2042 fruit (92%) contained more than 100 seeds. The average seed set was high whether the F<sub>1</sub> hybrids used in the mating had both parents, one parent or no parents in common.

The high incidence of male and female fertility found among these hybrids suggests that lack of fertility is not likely to present an obstacle to future study of the potato at the diploid level.

1/                      WISCONSIN                      3/  
W. L. Beale , Darrell Hunter<sup>2/</sup>, and F. J. Stevenson  
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### Frito-Lay, Incorporated Potato Breeding Program

In 1962, the potato breeding program of Frito-Lay, Incorporated, included the following tests:

At Madison, Wisconsin seed and seedlings were produced in the greenhouse and specific gravity and chip color tests were made on a large number of seedling varieties in the laboratory. The chip color tests were made on tubers directly from harvest and after several storage treatments.

On the Red Dot Research Farm at Rhinelander, experimental work consisted of growing first, second, third, and fourth year seedlings and a parent plot. In addition, 4 replicated tests were conducted to test seedling varieties and checks for time of maturity, yield, tuber type, specific gravity, reversion in chip color at harvesttime and chip color after various storage treatments.

In Alabama 4 tests were conducted, a replicated varietal test and 2 observation tests, one early and one late.

Observation plots were also planted in Florida, North Dakota, Minnesota, Colorado, North Carolina, Arizona, and Indiana.

#### Madison, Wisconsin

Approximately 16,000 seeds were planted in 2½-inch pots in the greenhouse. Four hundred and forty-four crosses and 5 selfed lines were made in the greenhouse. The calculated number of seeds produced was about 457,800. The specific gravity and chip color results obtained in the laboratory will be reported under the various Rhinelander tests.

#### Rhinelander

First year seedlings: 26,577 first-year seedling varieties representing 128 family lines were planted on the research farm. About 15,700 of these were produced in the greenhouse at Madison and 10,877 were obtained from the National Potato Breeding program at Beltsville, Maryland. At harvesttime 3,579 or 13.5% were selected for further testing.

Second year seedlings: 1796 seedling varieties were planted in 16 to 80-hill rows. At harvesttime 905 or about 50% of these were selected for testing in 50°, 45°, 42° and 38° storage treatments.

1/ Manager Genetic Research, Frito-Lay, Inc.

2/ Assistant in Genetic Research, Frito-Lay, Inc.

3/ Collaborator USDA and Consultant in Genetic Research, Frito-Lay, Inc.



Third and fourth year seedlings: One hundred and ninety selections representing 86 progenies were planted in 20, 4-cut tuber units to give 80 hills. These have all been saved for further testing in various areas of the country.

Parent plot: Fourteen named and 181 numbered varieties were planted in 10, 4-cut tuber units where they were rogued carefully in an attempt to maintain healthy stock of parent varieties.

Replicated tests: In 1962 a total of 58 numbered varieties were grown in 4 test plots with 4 replicates for each test. Each replicate was a single row planted with six 4-cut tuber units with the hills planted 1 foot apart in the row and the rows 3 feet apart.

Test No. 1 consisting of 29 early seedling varieties and 2 checks, RD 19 and Kennebec, were planted May 3 and harvested August 7. Test No. 2 consisting of the same early varieties, was planted May 3, and harvested September 20.

The late and medium late varieties were planted also in 2 tests of 4 replications each. Test No. 3 included 29 numbered varieties and Kennebec as a check. This test was planted May 3 and harvested August 9. Test No. 4 included the same varieties as those in test No. 3. Both tests were planted May 3 but test No. 4 was harvested Sept. 20.

Test 1. Early varieties harvested August 7. Yields: The early maturing check RD 19 yielded 206 cwt. per acre, Kennebec 205. The LSD at the 5% level was 19 cwt. per acre. Using this as the criterion of significance 16 varieties outyielded RD 19.

Specific gravity: The specific gravity of the varieties in this test ranged from 1.068 to 1.088 with a mean of 1.076. RD 19 scored 1.077, Kennebec 1.073. The LSD at the 5% level was .007. Four varieties were significantly higher in specific gravity than Kennebec. None was lower. Two varieties were higher in dry matter than RD 19 and one lower.

Chip color: Chips were fried on 4 dates, August 8, the day after harvest, and again on August 11, 14 and 17 to test the reversion factor found in some varieties that cause the chips to darken at different intervals of time at room temperatures. Twenty varieties showed little or no darkening. RD 19 and Kennebec lost color after 3 days. The color ranged from 81 to 90 with a mean of 87. The LSD at the 5% level was 2. With this as the criterion of significance 27 varieties were higher than RD 19, the early check.

Test 2. Early varieties harvested September 20: The same 29 early-maturing varieties as those in test 1, with Kennebec as a check, were included in test 2. Four replications of these were harvested on September 20.

Yields: Kennebec produced 372 cwt. per acre. The LSD at 5% was 29 cwt. per acre. With this as a measure of significance none of the 29 seedling varieties yielded so high as the Kennebec. This is to be expected since the seedling varieties were early maturing and varieties, the vines of which die early, will not yield so high as the highest yielding late-maturing varieties when harvested late in the fall.

Specific gravity: The specific gravity in this test ranged from 1.069 to 1.090 with a mean of 1.081. The LSD at 5% was .006. Twelve varieties were higher in specific gravity than Kennebec with a specific gravity of 1.076.

Chip color: A series of chip color tests were made on the early maturing varieties harvested September 20. Samples were fried on September 21, 24, 27, and 30. Contrary to the results with these same varieties harvested August 7 no reversion of color was evidenced in any of the varieties in this test. The average color for all varieties ranged from 87 to 90. Kennebec scored 89. No significant differences existed between varieties.

Test 3. Medium late and late varieties harvested August 9. This early harvest test included 29 numbered varieties medium late, to late in maturity with an early variety RD 19 as a check. They were planted in 4 replications May 3 and harvested August 9.

Yields: RD 19 yielded 228 cwt. per acre. With an LSD at the 5% level of 29 cwt. per acre only one variety was significantly higher in yield than the check. Thirteen were in the same class as the check.

Specific gravity: The specific gravity ranged from 1.066 to 1.092 with a mean of 1.080.

Chip color: Chips were made from these varieties on August 10, 13, 16, and 20. With an LSD at the 5% level of 3, the chips made from 22 varieties were higher in color on the average than those made from RD 19. The range in color was between 82 and 90 with a mean of 87. Eighteen of these varieties showed little or no increase in darkening at any date. The chips of RD 19 increased in browning after the first fry.

Test No. 4, medium late and late varieties harvested September 20. This test included the same varieties as those in test 3. The only differences were that Kennebec was included as a check and they were late harvested.

Yields: Kennebec yielded 365 cwt. per acre. The LSD at the 5% level was 32 cwt. per acre. Three varieties significantly outyielded Kennebec, 9 were in the same class and 16 were lower in yield than the check.

Specific gravity: The specific gravity ranged from 1.070 to 1.092 with a mean of 1.078. The LSD at 5% was .005. Kennebec had a specific gravity of 1.074. Eleven varieties were significantly higher in specific gravity than Kennebec. The other 18 varieties were in the same class.

Chip color: The color of the chips made from 4 fry tests, the day after harvest and at 3-day intervals for 9 succeeding days at room temperatures, did not show color reversion. All varieties scored 87 or higher in color with a mean of 89. There were no significant differences.

Comparison between early and late harvests. Yield--From August 7 to September 20 the early-maturing varieties changed in yield from a minus 9 to an increase of 179 cwt. per acre. The minus 9 was no doubt due to variability resulting from environmental factors rather than to a true decrease in yield. The mean increase for the early maturing varieties was 61 cwt. per acre.



The varieties in the medium-late and late-maturing group ranged from 0 to 233 cwt. per acre increase in yield in the period between August 9 and September 20. The mean increase for the group was 123 cwt. per acre compared with an increase of 160 cwt. per acre for Kennebec.

Specific gravity: The specific gravity of the early varieties harvested August 7 ranged from 1.068 to 1.088 with a mean of 1.076. On September 20 these same varieties ranged in specific gravity from 1.069 to 1.090 with a mean of 1.081. The specific gravity of the medium late and late varieties ranged from 1.066 to 1.092 with a mean of 1.080 on August 9 and from 1.070 to 1.092 with a mean of 1.078 on September 20.

Chip color: The chips made from the early varieties harvested August 7 ranged in color, for an average of 4 fries, from 81 to 90 with a mean of 87. Chips made from these same varieties, harvested September 20, ranged in color from 87 to 90. Kennebec chips scored 89. There were no significant differences between varieties with respect to chip color in the late harvest test.

The chips made from the medium late and late varieties harvested August 9 and chipped on August 10, 13, 16 and 20 ranged in color from 82 to 90 with a mean of 87. The chips from 22 varieties were higher in color than those made from RD 19. The chips made from these same varieties, but harvested September 20, all scored 87 or higher in color with a mean of 89. There were no significant differences.

#### Color Reversion

A reversion factor is indicated in some varieties that causes the chips to darken soon after harvest when the tubers are stored at room temperatures.

Seven of the 29 early varieties, and the checks RD 19 and Kennebec, showed the effects of this factor when they were harvested the second week in August, but none of them showed this phenomenon when harvested the third week of September.

The same can be said for the medium-late and late-maturing varieties. Eleven of them showed the effects of the reversion factor when harvested early but none of them lost color at room temperatures when harvested late.

The results might suggest that color reversion is associated with state of maturity but it will be necessary to design a definite genetic study to prove or disprove this.

Samples of most of the varieties from the 4 replicated tests were stored in rooms with controlled temperatures of 50°, 45°, 42° and 38° F. After removal from these temperatures they are conditioned at various intervals of time and chipped. The results will be given in the 1963 report.

In 1961, 109 advanced seedlings were subjected to 9 storage treatments. The data are given in Frito-Lay table 1.



Frito-Lay table 1. Number of seedling varieties, chips of which scored 80 or higher in color after 10 storage treatments, 1961.

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<u>Storage Treatments</u>	<u>Number scoring 80 or higher in color</u>
Harvest	109
Direct from 50°	104
" " 45°	45
2 weeks " 45°	93
Direct " 42°	61
2 weeks " 42°	104
4 weeks " 42°	108
Direct " 38°	0
2 weeks " 38°	39
4 weeks " 38°	87

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33 varieties scored 80 or higher in all treatments except direct from 38° storage.  
39 varieties scored colors of 80 or higher in all treatments except direct from 45° and 38° storage.

The results are similar to those reported for 1960. No variety has yet been found that will produce chips with acceptable color direct from 38° but about 1/3 of those tested in 1961 produced chips with a color 80 or higher with 2 weeks reconditioning after removal from 38°.

Alabama  
Varietal Plot

Yield. Twenty-one varieties ranged from 76 to 203 cwt. per acre with a mean of 159 cwt. per acre. One variety outyielded Russet Sebago significantly. Seventeen varieties were in the same class as Russet Sebago. Three varieties were significantly lower in yield than Russet Sebago.

Specific gravity. The specific gravities ranged from 1.057 to 1.084 with a mean of 1.073. The mean specific gravity of 1.073 was significantly higher than Russet Sebago with a value of 1.067. Twelve varieties were significantly higher than Russet Sebago on specific gravity readings.

Chip color. After 10 days based from harvest date, the chip color scores ranged from 79 to 89 with a mean of 87. Russet Sebago scored an 89 along with 7 other varieties. Nineteen varieties were in the same class as Russet Sebago, while two varieties were significantly lower. After 17 days, the color scores ranged from 80 to 90 with a mean of 88. Russet Sebago again scored an 89 and nineteen other varieties were in the same class. Only 2 varieties were significantly lower in color score than Russet Sebago.

Vine character. Eleven varieties were rated in the same class as Russet Sebago.

Disease. Six varieties were found to be disease-free with one variety having typical symptoms of spindle tuber, mosaic and leafroll.

### Early Observation

One hundred and sixty-two varieties were planted January 15, 1962. Frost killed most of these varieties, however, 6 varieties survived and were selected for potential frost resistant qualities.

### Late Observation

One hundred forty-one varieties were planted February 15, 1962. Sixteen varieties showed promise and will be returned for further testing in 1963.

### Florida

In 1962 five advance varieties were planted in a reasonably large scale observation test during the 1962 growing season. This test was supervised by Mr. Cy Yarborough of Palatka, Florida. The planting was made on February 3, 1962. Part of the seed had been frost damaged in transit. The growing season was not highly favorable, being hot and dry. Only 3 inches of rain fell during the growing season. Furrow irrigation was used on the field in which these observations were planted. Three of the varieties were earlier than Sebago. The other two were somewhat later. One variety showed outstanding drought resistance and vine type. Total solids ranged from 17.7 to 20.3 percent taken 3 days after harvest, which came May 21, 1962. Tubers of all 5 varieties made excellent chips both 3 days and 10 days following harvest.

### Minnesota-North Dakota

A total of 133 varieties were sent out to Minnesota, North Dakota, Colorado, and North Carolina for 10-hill observation plantings. Minnesota had a very late and wet planting season which resulted in such poor stands that no information was obtained. However, from the Grand Forks, North Dakota area, George Newton kept samples from 59 varieties considered to be of interest. Tests are being conducted on these from 3 different storage temperatures during the course of tests for the 1962-63 storage season.

Calculated yields ranged from 93 to 172 cwt. after a short growing season. With a yield of 150 cwt. per acre being considered good for the area, 23 of these varieties ranged between 154 and 172 total cwt. per acre. All but 12 of the 59 varieties sampled for further testing yielded 126 cwt. per acre or better, which would normally be considered as acceptable to good yields for the area.

Specific gravities, as usual, were high on the Grand Forks samples, ranging between 1.071 and 1.095 direct from 50° F. storage approximately 4 months after harvest. Twenty-four of these read 1.085 or better in this series of tests.

Twenty-five of the 59 varieties were scored 85 or better on color both at harvest time and on the 4 months from 50° storage tests.

### Colorado

Information for this area is incomplete. Nineteen variety selections were made. No yield data was kept and specific gravity and color evaluation is still in progress. Either the area or the season seemed to be conducive to the development of hollow-heart. Many of the varieties were discarded at harvest due to a predominance of this characteristic.



### North Carolina

Samples of all 133 varieties were received in Madison for evaluation of color and specific gravity. No selection was made in the field at the time of harvest. From the group, of 133 varieties, a sub-group of 20 varieties was selected on the basis of yield, specific gravity, and chip color performance up to 15 days following harvest. Since this was a non-replicated observation test, no statistical analyses have been made. For this reason, some of the differences discussed below would not be statistically significant.

Kennebec as a check had a calculated yield of 367 cwt. per acre. Thirteen of the 20 varieties yielded more than Kennebec, ranging from 369 to 515 cwt. per acre.

The specific gravity range was from 1.053 to 1.069 with Kennebec being 1.060. Nine of the test varieties had a higher specific gravity than Kennebec in this test.

Color scores ranged from 80 to 90 on the 7-day test and 86 to 89 on the 15-day test. Kennebec scored 87 on the first series and was equaled or outscored by 15 of the 20 varieties. On the second fry, Kennebec scored an 88 and was equaled or beaten by 12 of the 20 varieties. Actually, the color scores on all but one variety in this test would have been considered acceptable by the chip trade in the period between harvest and 15 days following harvest. That one variety scored 80 and 86 respectively on the two chipping tests.

### Arizona

In 1962, ten Red Dot varieties were compared in field and processing performance with Golden Chipper at Queen's Creek, Arizona. Of the ten, RD 8, RD 36, and RD 60 were superior in yield and chipping performance at early harvest. RD 53 and RD 86-7 were somewhat later and may offer competition to Kennebec in this area. The mean yield, excluding Golden Chipper was 230 cwt. per acre. The range was 160 to 298 cwt., with Golden Chipper yielding 300 cwt. per acre.

Specific gravities ranged from 1.074 to 1.083 with a mean of 1.079 as compared to Golden Chipper's 1.073. Chip colors at harvest and after 4 weeks at 70° F. appeared fair to good. All 10 RD varieties had harvest colors better than that of Golden Chipper which rated below 75 as converted from a reflectance reading to equivalent chip score by the Red Dot scale. All RD varieties improved during the storage period, but Golden Chipper was not evaluated except at harvest. RD 8, 36, 53 and 60 will be given more extensive tests in the area as soon as possible.

### Indiana

In 1962, 10 Red Dot varieties were tested in a replicated planting together with 10 other named and 2 numbered varieties from other sources. This test made in cooperation with the Horticultural Division, Purdue University, encompassed both early and late harvest evaluations. The factors of yield, percent "A" Size, specific gravity, chip appearance, second growth and growth cracks were considered.

RD 5 topped the list in yield at both harvests, however the chip color performance at late harvest was erratic. RD 46 therefore appears to be the only late RD variety of interest for further testing from this group of RD seedlings. RD 7 may have some value in the area as an early planting. Both of these varieties gave good chip color performances. The yield of RD 46 was intermediate at both harvests, but RD 7 yielded low, by comparison, at both harvests.



WYOMING

W. A. Riedl and Lawrence A. Schaal

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The potato breeding work in Wyoming in 1962 consisted primarily of breeding for desirable type, maturity and color, with high yield, high percentage of solids and resistance to scab and ring rot. Thirty seedling families were grown and selections were made for these characters.

Fifty-four seedling selections were grown in one-row-plots 40 feet long, 40 selections were grown in one-row-plots 15 feet long and 40 selections were grown in 4-hill units at Laramie. A similar planting was made at the Cheyenne Horticultural Field Station. In addition 54 selections were tuber indexed and increased at the Cheyenne Station.

A study of the inheritance of specific gravity was initiated. The parents of high and low specific gravity together with the progenies of crosses were space planted 3 x 3 feet apart and the specific gravity of the tubers was obtained.

Four replicated yield trials were conducted at 3 locations. The results of these trials are shown in Wyoming tables 1, 2, 3 and 4. Eighteen promising seedlings were increased at Laramie and 18 seedlings were increased at Torrington. A highly ring rot resistant seedling (W 1122) is being considered for release.

The 1962 season was very unfavorable for potato production. Hail and early killing frosts resulted in low yields and low percentage of solids.

Wyoming table 1. Potato variety trial at Laramie, 1962.

Variety	Total Yield per acre	U. S. No. 1 Yield per acre	U. S. No. 1's	Solids
	Cwt.	Cwt.	Pct.	Pct.
Red Pontiac	200	180	90	18.2
Kennebec	195*	168*	86	19.9
Norland	183*	158*	86	18.6
LaSoda	172*	141	82	18.8
Satapa	159	140	89	18.2
Catoosa	152	123	81	16.5
Haig	146	124	85	--
Early Gem	119	99	83	18.2
Yampa	107	95	89	19.7
Sheridan	80	72	90	--
General Mean	151	130	86	18.5
L.S.D. 5% Level	29	28		

1/ 1 7/8 inch minimum.

\* Statistically equal to the highest yield at the 5% level.

Previous crop--alfalfa.

Date planted--May 29.

Planted in 1-row plots 40 feet long with 4 replications.

Rows spaced 3 feet apart with hills spaced 1 foot apart.

Fertilization--80 lbs. of nitrogen and 80 lbs. of P<sub>2</sub>O<sub>5</sub> per acre were applied to the surface and plowed under.

Irrigations were applied July 1, August 8 and 20.

Dusted with sulphur and 5% DDT, July 6 and August 7.

Rogued July 18, August 5 and 19. Dates of frost--August 30, Sept. 2, killing frost Sept. 9. Date harvested--Sept. 26. Date of grading--Nov. 23.

Wyoming table 2. Potato seedling trial, Laramie, Wyoming, 1962.

Seedling Number	Total Yield per acre	U. S. No. 1 <sup>1/</sup>		Solids
		Yield per acre	No. 1's	
	Cwt.	Cwt.	Pct.	Pct.
W 2854	132	116	88	18.4
W 2999	129*	110*	85	18.0
W 3079	123*	113*	92	17.5
W 3092	108*	93*	86	17.5
W 3792	106*	83	78	17.5
Minn. P13	98	90	92	18.6
W 3069	95	73	77	--
W 3065	60	53	88	--
W 2825	58	50	86	18.8
W 2550	43	38	88	--
General Mean	90	82	86	18.0
L.S.D. 5% level	30	30		

<sup>1/</sup> 1 7/8 inch minimum.

\* Statistically equal to the highest yield at the 5% level.

Previous crop--alfalfa. Date planted--May 29. Planted in 1-row plots 40 feet long with 4 replications. Rows spaced 3 feet apart with hills spaced 1 foot apart. Fertilization--80 lbs. of nitrogen and 80 lbs. of P<sub>2</sub>O<sub>5</sub> per acre were applied to the surface and plowed under. Irrigations were applied July 1, August 8 and 20. Dusted with sulphur and 5% DDT, July 6 and August 7. Rogued July 18, August 5 and 19. Dates of frost--August 30, September 2, killing frost Sept. 9. Date harvested--September 26. Date of grading--November 23.

Wyoming table 3. Potato variety trial, Torrington, Wyoming, 1962.

Variety or Seedling	Total Yield per acre	U. S. No. 1 <sup>1/</sup>		U.S. No.1's	Stand	Solids
		Yield per acre	Rank			
	Cwt.	Cwt.		Pct.	Pct.	Pct.
Haig	234	189	1	81	96	16.5
Red Pontiac	222*	173*	3	78	96	13.7
Red LaSoda	209*	175*	2	84	97	15.2
Norland	205*	166*	4	81	91	17.7
Teton	205*	158	5	77	86	16.7
Catoosa	200	134	9	67	91	15.4
Kennebec	194	146	6	75	73	16.2
W 2578	174	144	7	83	96	15.4
Early Gem	171	104	14	61	91	15.6
W 2854	169	137	8	81	93	15.6
Cayuga	163	125	10	77	97	18.4
W 2598	150	113	11	75	85	15.2
W 2746	129	107	12	83	79	15.4
W 2795	128	102	15	80	76	15.8
Sheridan	127	104	13	82	83	16.5

continued

Wyoming table 3, continued.

Earlired	116	91	17	79	78	16.0
W 2882	111	92	16	83	79	15.2
Redbake	81	59	18	73	91	16.0
General Mean	166	129		78	88	15.9
L.S.D. 5% level	29	28				

1/ 1½ inch minimum. \* Statistically equal to highest yield at the 5% level.  
 Previous crop--alfalfa. Date planted--May 24. Planted in one-row plots  
 35ft. long, with 4 replications. Rows spaced 3 feet apart, with hills  
 spaced 1 ft. apart in the row. Date sprayed with DDT--July 3 and 11. Date  
 of killing frost--September 8. Date harvested--September 28. Date graded--  
 November 27.

Wyoming table 4. Potato variety trial, Powell, Wyoming, 1962.

Variety or Seedling	Total Yield per acre	U. S. No. 1 <sup>1/</sup> Yield per acre	U. S. No.1's	U. S. No.1's	Stand	Solids
	Cwt.	Cwt.	Rank	Pct.	Pct.	Pct.
Red LaSoda	320	260	1	81	94	20.1
Red Pontiac	313*	243*	3	78	95	--
Teton	295*	234*	5	79	92	19.4
Haig	280*	249*	2	90	95	20.7
Kennebec	280*	211*	9	75	89	20.3
Norland	276*	243*	3	88	96	18.8
Early Gem	270*	221	8	82	96	19.4
W 2854	235	195	10	83	94	19.0
Red McClure	200	124	7	62	95	20.7
Russet Burbank	194	125	6	64	79	20.9
W 1122	147	118	11	80	70	19.2
W 2598	147	116	12	79	63	18.8
Earlired	127	92	13	72	94	19.4
General Mean	237	187		79	88	19.7
L.S.D. 5% Level	66	38				

\* Statistically equal to the highest yield at the 5% level.

Date planted--May 13.

Planted in one-row plots 40 feet long with 4 replications.

Rows spaced 3 feet apart with hills spaced 1 foot apart in the row.

Dates irrigated--May 1 (preplant), June 28, July 17, and August 7.

Date of killing frost--September 8.

Date harvested--September 29.







